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Telephony.

THE AMERICAN TELEPHONE JOURNAL

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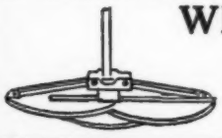

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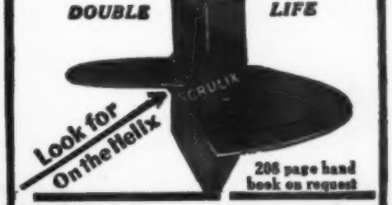

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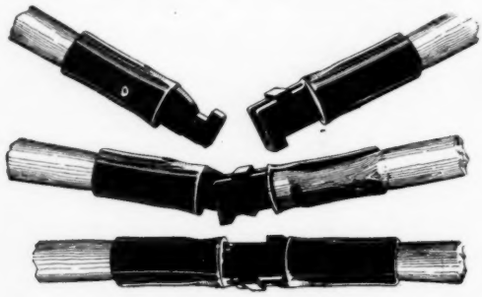

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Telephony.

THE AMERICAN TELEPHONE JOURNAL

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By the Way—

"The war is ended" was the telephone message many times repeated recently.

Despite shortage of operators due to the Spanish influenza and general conditions, the enormous telephone traffic arising from the false peace report on November 7 and that due to the real report, was handled in a creditable manner.

The quick rush to the telephone of thousands, for verification of the peace news and for passing it on, shows what a hold the telephone has on the American public. An "inviting" business policy adopted by the government will continue to develop the telephone habit and consequently the business.

The War Is Over.

The war is ended, and the cause of freedom has triumphed! The United States and her allies have conquered the brute autocracy whose lair was in Germany. Now will follow the peace negotiations which should forever make impossible the repetition of such a crime as Prussian militarism committed.

Beginning in the small hours of Monday morning, the American people have been celebrating the great victory. With the lifting of the terrible tension, they returned to the joyous ways of children and expressed their happiness in a carnival of sheer joy that proved how fierce had been the war strain.

As though we had been imprisoned in a pitch-dark vault, the coming of peace has liberated our spirits and once more we greet the sunshine with a burst of joy but with a deeper appreciation of what liberty really means.

Liberty and peace will have a new meaning to this generation of Americans hereafter, and that will make our country better and stronger than it has ever been in the past. The flag will count for more than ever before.

Three cheers for the Stars and Stripes!

And now what?

We are told that much remains to be done before all the peace treaties are written and ratified. The American armies are not coming home tomorrow, for it is the American way to "clean up" after doing a job, and there is much disorder to set right in those war-torn countries of Europe.

At the same time, the Yankees have a habit of developing a speed that accomplishes what looks like a two-year task in almost as few months. That's the record we established in making war. May we not duplicate that record in making peace?

At all events most business leaders see no good reason for expecting anything but good times. Swords have to be turned into pruning hooks; war factories have to go back to the industries of peace, but a new morale—a new strength—has flooded the people of the United States that will carry them safely through the period of readjustment.

In scores of commercial lines nothing much has been done in the last year. The coming of peace will stimulate demand in these activities which war ruthlessly shoved into the background. The simple consciousness that the fighting is over, will give vent to such an overwhelming flood of relief and confidence that prosperity will follow inevitably. The war profiteer may mourn the fall of prices, but, heaven knows, it is high time he did a little mourning!

The immediate effect of peace on the telephone industry remains to be seen. One thing clear to those close to the situation is that government control of the wires will not terminate at once just because the Germans have all "kameraded" and the ex-kaiser and his gang have fled to Holland.

Telephone men are still employes of the government. The joint resolution of Congress which authorized control over the wire systems of the country, provided that federal "supervision, possession, control, or operation shall not extend beyond the date of the proclamation by the President, of the exchange of ratifications of the treaty of peace."

Just how long it will take to fix up peace treaties with the 22 nations who were warring against Germany, nobody now knows. There are many opinions, some expressing a short period and others a long period.

It is not to be denied, however, that sentiment is growing stronger against much of what may be called paternalism on the part of the government. The idea of letting a government assume too large a share in business affairs was given a tremendous bump when the war

was lost by the German military caste which claimed the right to run everything.

Recognition of the right and wisdom of preserving individual initiative received a correspondingly significant endorsement at the same time. The congressional elections last week also indicated a strong conviction among the people that they are not ready for more centralized authority just yet.

Telephone men are advised to proceed as they have been doing since August 1, 1918. The war is over but the "exchange of ratifications of the treaty of peace" has not occurred.

Meanwhile the great necessity for war materials is less, and there should be less restriction in the buying of needed telephone equipment. Many companies are in need of apparatus, but have been holding up orders so as not to interfere with war work. The Post Office Department should soon modify its order forbidding all but emergency extensions, and thus permit telephone companies to prepare for peace activity.

A Look Forward as World War Ends

Many Complex Problems Will Be Encountered in Changing from War Basis to Peace Footing—Conditions Which Augur Well for Future—Facts Tending to Stabilize Conditions During Period of Change—Telephone Conditions

By Stanley R. Edwards

The sun is sinking low on the horizon. It is the sun to which the ex-kaiser referred when he spoke of seeking "a place in the sun." Its setting marks the close of a long day—a day, the end of which is joyfully welcomed by the entire world.

As this sun sets, we turn our faces in the opposite direction, ready to face the rising of a new sun, marking the beginning of another day—a day which will be entirely different from that which is closing. But before a new sun rises we must pass through a night whose darkness will be greatly softened by the moonlight of preparation due to experience.

After the War.

What will come after the war is a question in which everyone is interested, and the answer to which is being sought throughout the world. America did not change in a day from a peace basis to a war-time footing, for it was almost three years after the first orders issued by the ex-kaiser were carried out by his eager armies that the United States threw its deciding influence on the scales opposed to the world domination ambition of Germany.

In those three years much had been done in this country toward placing the nation on a war-time footing, so that our actual entry into the war found our business more or less prepared. With the coming of peace, the energies which for so long have been directed toward the doing of things essential to the successful prosecution of the war, will necessarily be turned into other channels.

There are those who believe that there will be a closing down of industry, but the banker and the business man who have carefully studied conditions, have other opinions. It is true that there will necessarily be changes in work, or rather in the products turned out by the manufacturing establishments.

One of the problems which perplexes many is that relating to the absorption of the vast number of men now in our armies who may shortly be returned to civil life. It is feared that there will not be employment for them, but let us take a look ahead.

Out of this war will come, undoubtedly, new industries which have sprung into active existence during the past year and a half. It is certain that the shipbuilding industry, which is now employing many thousands of men, will continue. Naturally the building of ships affects other industries, for not only is the lumbering industry affected, but the steel and many minor industries from which the various equipment and supplies for the ships must come.

The manning of the ships built by the government is bringing into the American merchant marine a higher class of men, and there are opportunities for them, too. A majority of the men now in the service of the Navy, manning the various ships, will never go back to their former occupations. And no longer will the merchant marine service be looked down upon. It will be recognized as a great industry, employing thousands of men.

The automobile industry has been at a standstill for many months. After the war, there will be a greater demand than ever before for automobiles, and the facilities of the large automobile plants which have been devoted exclusively to the manufacture of war munitions, will be taxed to the utmost to supply the demand for pleasure and commercial vehicles.

Demand for Better Roads.

One thing this war has developed is the necessity for good roads—and the increased production of pleasure and commercial cars naturally will carry a demand for better roads. Better roads mean employment for many men.

Only last week the people of Illinois approved the expenditure of $60,000,000 for the building of good roads as soon as the war ends. Other states will undoubtedly follow in the footsteps of Illinois.

We must not overlook the "marriage industry" which has flourished in the year and a half this country has been in the war and which will increasingly prosper as the army disbands. Homes will be required by the women war workers who will enter the new industry. Their positions will be filled to a large extent by the returning warriors.

The "Marriage Industry."

After the homes are built, furnishing goods of all kinds will be in great demand. The activity in this industry will have a most stimulating effect upon practically all commercial industries, and the telephone companies will be in line for many new subscribers.

It must not be forgotten that for years America has depended for its unskilled labor upon Europe. But Europe, after the war, will need all of its unskilled labor to repair the ravages due to the destructiveness of the Hun. Hence emigration from Europe will be restricted and the work here must be done by our available forces.

We must not forget that the production of so-called unessentials has been greatly reduced and in many lines stopped for the period of the war. When peace comes, these activities will go forward again with a greater impetus than ever before.

Railroad construction and repairs have been confined only to that actually required by war needs and telephone expansion is likewise restricted. There should be great activity in these utilities to make amends for the enforced neglect of the past four years.

These are some of the promising fields for the absorption of the man-power that will be released for constructive purposes within the next few months.

During the war the government assumed many powers which previously

had not been exercised by it. It took control of entire industries, engaged in business, supervised distribution of products, and fixed prices for certain commodities. All these things and others were done as war necessities, and were unopposed by the people, for the statement was accepted that such steps were essential to the winning of the war.

In passing from a war basis to a peace footing, many complex problems are presented for solution. And in their solution the part that the government will take is naturally one of great interest. That it should take an important part is unquestioned—but how great a part is a problem which arouses a great difference of opinion.

The conditions confronting the country may be briefly stated as embracing these facts:

Commodities' prices are from 100 to 500 per cent above normal; they must now return to normal in obedience to the law of supply and demand.

Labor is commanding an abnormal wage and is congested into certain communities; the abnormal wages naturally must come down and labor be more evenly distributed.

Abnormal earnings of some concerns have disturbed credit relations of business so that the credit system will have to be revised and each company given a new rating.

The normal relations between merchant and customer have been destroyed and must be restored if possible without an intervening period of unrest and disquiet.

In passing from these abnormal conditions, there are many factors which will have a stabilizing influence during the period of industrial readjustment. The War Industries Board has announced a liberal policy in the cancellation of war contracts and generous allowances for expenses already incurred. Other factors are the Federal Reserve banks, the price-fixing policy of the government and the more intelligent organization of business, including sound accounting methods.

The Federal Reserve banks will not prevent failures in cases where insolvency already exists. They will, however, enable private banks to furnish credit to companies which are really good.

It is obvious that if purchases of goods are made subject to changes in prices as fixed by the government, mercantile liabilities will be made somewhat more liquid so that concerns operating under fixed prices can go ahead with a clean slate. They will not be embarrassed by long purchasing contracts extending into a period of declining prices.

The guaranteed price of $2.26 for the entire 1919 wheat crop does not mean bumper crops of corn, oats, or other cereals. Hence there will not be heavily lowered prices for these products or for meats. Government price maintenance for coal and possibly other commodities is probable for most of next year. Hence there will be no rapid fall in prices of general commodities.

Since 1910 better business methods have been in vogue and unsound methods of accounting and finance have been eliminated by many organizations. Most large corporations have been laying aside reserves from present earnings to insure against any unfavorable developments in business conditions which may cause depreciation of assets due to the war's ending.

Most of the new business projects are being advanced either by large companies, financially strong, or by the government, itself, as in the case of shipbuilding. The banks are thus left free for the financing of the smaller local enterprises as the War Finance Corporation and the Treasury take care of the larger financing.

A consideration of the wage situation indicates that there will be no rapid fall. The great shipbuilding program will employ a considerable volume of skilled labor at high wages. Under government regulation these wages will hardly be sharply reduced.

Then the railroads of the country are to be continued under government control for 21 months after the declaration of peace. This does not presage a drastic cut in wages for the presidential election will then be close at hand.

A drastic fall in wages with the attendant train of strikes and eventual "hard times" would almost certainly mean a political upheaval in 1920. The party in power will prevent such a condition if it possibly can.

A study of these facts leads to the conclusion that while problems, many, serious and complex, will have to be solved before the world returns to normal, we will not pass through a period of great depression. For several years, at least, business will be prosperous and by that time the most critical period will have passed.

For some time the telephone systems of the country will undoubtedly continue under government supervision and operation, and this should exert a favorable influence on the industry during the change from a war footing to a peace basis.

It has taken many years for the building up of the telephone industry to its present powerful position. Since the expiration of the fundamental Bell patents,

Resolutions Adopted at Meeting of Directors of Missouri Telephone Association at Kansas City, Mo., November 4, 1918.

Resolved, That the fair action of Postmaster General Burleson in his administration for the account of the United States of the telephone lines, exchanges and properties, of the members of the Missouri Telephone Association, of which the President of the United States has taken possession and control under the joint resolution of Congress adopted July 15, 1918, be and the same is hereby endorsed; and

Be It Further Resolved, That this Association, by its directors assembled, pledges its continued support to the future administration by the Postmaster General for the account of the United States of the lines, exchanges and properties of its member companies, during the entire period of possession and control under the aforesaid joint resolution of Congress and that this resolution be published in TELEPHONY, the official publication of this Association.

Resolutions Adopted at Meeting of Directors of Kansas Independent Telephone Association.

Upon motion of H. L. Harris, duly seconded by J. D. Waters, the following resolutions were unanimously adopted at the meeting of the directors of the Kansas Independent Telephone Association at Kansas City, November 4, 1918.

"Resolved, That the fair action of Postmaster General Burleson in his administration for the account of the United States, of the telephone lines, exchanges and properties of the members of the Kansas Independent Telephone Association, of which the President of the United States has taken possession and control under the joint resolution of Congress adopted July 15, 1918, be and the same is hereby endorsed; and,

Be It Further Resolved, That this Association, by its directors assembled, pledges its continued support to the future administration by the Postmaster General for the account of the United States, of the lines, exchanges and properties of its member companies, during the entire period of possession and control under the aforesaid joint resolution of Congress and that this resolution be published in TELEPHONY, the official publication of this Association."

it has grown by leaps and bounds, due to the "inviting" policy pursued by the Independent companies in contradistinction to the "throttling" policy followed by the Bell company.

Statistics show that the greatest development of the telephone lies in the great Middle West. It is there where the Independents have thrived and where telephone service is at its best.

With the expansion of activities in all lines, as has been indicated, there should be a great expansion of telephone service. It is well known that the government wants to popularize the telephone—to make possible "a telephone in every home." In other words, it expresses an "inviting" policy in the conduct of its telephone business.

War conditions made it essential that a "throttling" policy of business be temporarily adopted. With the dawn of peace, the "throttling" policy will undoubtedly change to the "inviting" policy —a policy which has always been pursued by the Independent companies.

Industries to Change Gradually from War to Peace Basis.

In the Official U. S. Bulletin of November 9, B. M. Baruch, chairman of the War Industries Board, makes the following announcement:

"For some time to come, assuming the armistice will be signed, for a period to be determined by the war-making agencies of the government, government contracts must continue on a wide scale. This circumstance applies to a considerable share of present contracts.

As the demand of raw materials is lessened by the reduction of war requirements and the cancellation of war contracts, if and when such cancellations be made, the raw materials so made available will be released and allocated by the War Industries Board, for use in supplying civilian and export demands, which through curtailment have been held in check during the war. In addition to the ordinary commercial requirements, there will be a heavy flow of materials thus released to supply the demand for the great reconstructional work required by the European countries.

At the same time, there is to be a gradual lifting of the restrictions and curtailments that have been imposed upon industry by the exigency of the war so as to allow as promptly as possible, free flow of all supplies into peace channels.

The War Industries Board will continue to exercise its functions until the peace treaty is signed, to the end that the readjustment of the matters on which it has been acting may be made in as orderly a manner as possible.

A committee named by the President has been and is now at work to devise the best mechanism of bringing about the adjustment from a war to a peace basis. The report of the committee may take the form of suggested legislation.

The whole effect of the readjustment plans will be to the end of bringing about necessary changes with as little dislocation as possible and the full opportunity for all to benefit, as in the past, by individual ingenuity, vision and fair dealing."

War Brings Additional Problems to Companies.

Patrons are too prone to measure service by that rendered in normal times, that is, before the United States entered the war, J. E. Farnsworth, vice-president of the Southwestern Telegraph & Telephone Co., stated recently. It is hard to keep efficient help, even though they have been paid while they are being trained, and various war activities have made much more work for the telephone operators, he declared.

"These conditions have brought about a state of affairs unprecedented in American industry," Mr. Farnsworth continued. "Telephone companies were among the first to feel the change because all questions pertaining to the war were promptly discussed over the telephone. The effect was instantaneous and conditions, since the declaration of war, have been changing hourly.

"One of the things that has disturbed the evenness of the service is the change in the use of the telephone which has developed recently and as a direct result of the war. Places where there was little demand for service have suddenly developed tremendous activities. Other districts have, to some extent, fallen off in their demands. War activities are always of an emergency nature. These emergencies create the abnormal demand for telephone service.

Every special drive with its time limit means abnormal telephone traffic. Liberty Loan, Red Cross, Y. M. C. A. campaigns all had their great increase in telephone service. Even a special social event carries with it a peak in telephone traffic. Our plant was built in normal times to care for normal traffic. The forces of war activities have naturally upset our calculations. It is with difficulty that we strive to meet the unexpected.

Our operating force of some 700 young women must necessarily be worked according to a prearranged plan. Every girl must be told a few days in advance just what hours she is expected to put in at the switchboards.

We are losing more operators than we did a year ago. This is only a manifestation of that general unrest and anxiety which exists. We are doing everything possible to meet these conditions by making the work of switchboard operating as attractive as we can and by improving the teaching, training and practicing of operators in our operators' training school so that competent operators for commercial service may be more quickly developed.

With the beginning of the war, the importance and necessity of the telephone became greater and the importance attached to it became correspondingly great. More people wanted to talk. Battles were raging, loved ones were offering their lives for the preservation of our country and our liberties. Folks at home wanted to know everything about it. They still want to know. The effect of it all was that the telephones are called on to carry the messages, answers, the inquiries, give the news quickly, to impatient patrons.

The national impatience has increased by leaps and bounds. There is a psychology in war that makes for increased impatience and temper in people. Where there were thousands of impatient telephone patrons three years ago, there are tens of thousands of them now.

The personal equation is the patron and the operator. If the person calling the number is impatient, sarcastic and surly, the immediate effect on the operator is to at once arouse her apprehension if not disgust. She knows that, if the patron were talking face to face with her, the former would hesitate to be rude. The idea is at once suggested that the patron is taking advantage of the operator. The operator is human, the patron is human. Impatience on the part of the patron has just a slight damaging effect on the service. Multiply this impatience by tens of thousands in war time and the telephone service suffers in proportion.

One thing the telephone patron forgets is that he is measuring our service by that given at the highest point of efficiency before the war. In those complacent days we were not troubled by many of our girls wanting to change. Our conditions of work were pleasant. We surrounded them with every comfort we could think of or devise, their friends were going their daily ways with only the ordinary cares and annoyances of life, and things were rocking along normally. Our patrons are comparing the service of normal times with the service of the present. If the patron of the telephone will look about him, he will find that changed circumstances have affected him personally to a greater degree, perhaps, than they have the service of the telephone company."

Ohio Telephone Convention May Be Held in December.

The annual convention of the Ohio Independent Telephone Association has for many years been held the latter part of November. This year, on account of the prevalence of the Spanish influenza, it was definitely announced by President Frank L. Beam that the convention will not be held this month. "If conditions change," states Mr. Beam, in a telegram to TELEPHONY, "will hold convention some time in December and will notify you."

"Telephony's" Home Study Course for Telephone Men

A Complete Presentation of the Principles Underlying Modern Telephony in All Its Branches—Arranged Systematically So That Regular Reading and Faithful Study Will Qualify Ambitious Men for Higher Positions—Prepared Under Supervision of Stanley R. Edwards—This Section Written by Jay G. Mitchell

Quiz Questions on the Preceding Installment.

1095. Explain how the connection of a condenser in parallel with the winding of the switch magnet makes possible a more complete utilization of the energy of the current impulse in driving the switch wipers ahead. With such an arrangement, is it possible to deliver impulses to the magnet windings faster than usual and still be assured of obtaining satisfactory results regardless of the increase in the impedance of the magnet windings that would ordinarily be produced by the increased frequency of the impulses?

1096. What is the factor fixing the limitation as to the speed at which impulses may be effectively utilized in the switch magnet windings? Explain how the connection of a condenser in parallel with the magnet windings has the effect of prolonging the flow of energizing current through them. Give an incidental effect of the connection of a condenser around the winding of the switch magnet. Is a switch ever advanced by impulses controlled by contacts made through its own wipers and bank contacts? Give an illustration. What is an essential quality of any condenser connected in parallel with the winding of the switch magnet?

1097. What is the average number of steps taken by a single-motion switch having 50 circuits presented in its bank contacts if such circuits are all connected in one group? How many steps must the wiper shaft take, in a two-motion switch having 100 contacts in its bank, to reach the bank contact whose number is 44?

1098. Why is the greater portion of two-motion switches in service equipped with bank contacts in ten rows of ten contacts per bank? Has such an arrangement any advantages when considered in connection with the assignment of subscribers' telephone numbers as they are to be published in the directory?

1099. What is the primary movement of the wipers in almost all two-motion switches? How many electromagnets are required to place the wipers on the desired bank contact?

1100. What are the operative functions of the two-motion switch? What is meant by the restoration to the normal position? Is this very important? Why?

1101. What type are almost all two-motion switch magnet arrangements? Point out the error in the second paragraph of section 1101. Why must the impulse be of longer duration than the interruption in the case of two-motion switches? What are slow-acting relays? Review the theory of slow-acting relays as they are of great importance in mechanical switching.

1102. Give the argument advanced in favor of advancing the wipers of two-motion switches in the horizontal plane before they are advanced in the vertical plane. What is your opinion of the value of this argument?

1103. What is represented in Fig. 284? What is the function of the electromagnet 3? Of the electromagnets 1 and 2? What do we understand to be the function of 18? Why is the barrel containing the vertical grooves, 16, made so long?

CHAPTER XXXII. Mechanical Switching (Continued).

1104. *The vertical impulses.*—It is obvious that auxiliary switching means are required to send current impulses first through the vertical magnet and later through the rotary magnet as the selection progresses toward completion. The means adopted for use with the type of switch shown schematically in Fig. 284 is known as the side switch (not shown).

For the present, it is sufficient to state that the first impulses received are sent through the winding of the vertical magnet, 3-4. The coils of this vertical magnet are mounted on a rigid framework which also supports all the other parts of the switch. As a matter of fact, the complete switch is so made as to be easily removable in case of trouble from its normal position in front of its banks.

Associated with the two coils and yoke of the vertical magnet, is a lever, 5, and an armature placed in close proximity to the pole piece of the magnet but separated from it by the air gap, 13. The lever, 5, is pivoted at 12 so that when the armature is drawn to the pole pieces of the electromagnet, 3-4, the pawl, 7, will be thrown upward. When the switch shaft is in its normal position, the pawl, 7, is so placed as to engage the flat horizontal under surface of the first sharp-crested ridge on the shaft.

1105. *Operation of vertical impulse mechanism.*—The first vertical impulse forces the pawl upward and through it the entire shaft with its wipers. At the end of the impulse, the pawl drops back to normal position—the magnet no longer holding the armature and lever in which it will engage the under side of the next ridge.

The detent, 18, is not shown as it is actually constructed in the commercial form of the switch but serves to illustrate the method of holding the shaft after the vertical pawl has been released and has returned to normal position. In the placing of the detent, 18, in the drawing an error was made, as it should have been located at a point that corresponds to the position of the vertical pawl, 7. It is obvious that the drawing shows the switch shaft after it has been raised three steps and is about to start on the fourth.

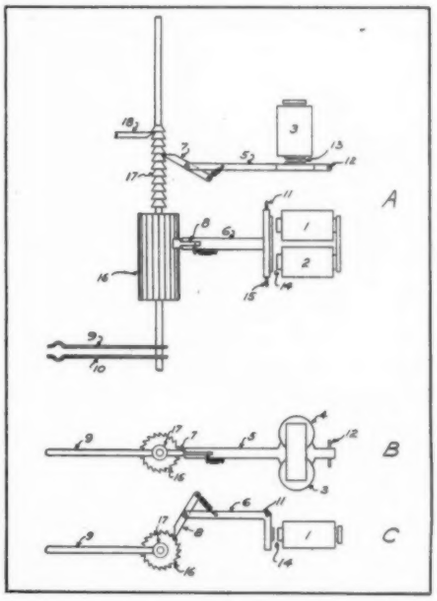


Fig. 284. Wiper-Advancing Elements of Two-Motion Switch.

With the detent, 18, located as shown, the shaft would not have been retained in its several successive vertical positions and could not have been driven upward progressively. It is clear that the detent, 18, must be so placed as to retain the shaft in each position taken after the first vertical step until selection is complete.

This detent, in the type of switch illus-

trated, is known as a "double dog." It serves not only as a detent for the shaft during its vertical travel but, by means of another pointed extension, during rotation in the horizontal plane, also. The "double dog" serves as the detent for the shaft during its vertical travel, and when the rotation of the shaft begins, it prevents a return to normal in the horizontal plane. At the beginning of the series of rotary impulses, the matter of retaining the switch shaft in the vertical position to which it has been driven, is delegated to another piece of mechanism known as the "fixed dog."

1106. *The rotary impulses.*—After the series of vertical impulses is complete, assuming that the switch is one both motions of which are controlled from the calling telephone, the auxiliary switching means just referred to effects the disconnection of the vertical magnet winding and the substitution for it of the vertical magnet winding.

While the mechanical arrangement by which this is accomplished, must be left to a later section, the electrical condition depended upon to bring this circuit change about is worthy of note now. The series of vertical impulses are produced by a mechanical interrupter in the calling telephone wired in series with the line and the transmitter and receiver.

When the calling subscriber rotates the dial of his telephone to the position indicated for the first digit of the number being called, a clock spring is wound and a train of wheels set so that their subsequent release will operate a cam and interrupt the circuit through the telephone and line as many times as there are units in the first digit or figure of the called number. For instance, if the first digit is five, the mechanism will cause the interruption of the circuit through the telephone instrument to occur five times as the clock spring unwinds.

While the interrupter in the telephone is wired in series with the transmitter, it is provided with contacts so arranged that a positive shunt around the transmitter is created during the sending of impulses. In this way the possible variable resistance of the transmitter is eliminated from the circuit through which switch-driving impulses flow.

The production of ragged and weak impulses and incomplete circuit interruptions is prevented by substituting a path of definitely low resistance for one of variable resistance. In other words, the resistance of the telephone transmitter, when included in the circuit, is sure to vary from one instant to the next and this variation *may be* of sufficient importance to produce a series of impulses so weak at times as to have the effect of a complete interruption when none is desired. With a clean-cut circuit of definitely low resistance through positively operated shunt springs, impulses are of definite length and the total resistance through which the current flows is practically constant.

1107. *The second digit.*—After the series of vertical impulses is complete, the interrupter in the telephone has returned to normal position. As a result, the circuit through the line and instrument is closed and remains so for a comparatively long time. This is the period during which the calling subscriber is setting the dial for the next digit.

The comparatively protracted closing of the line and instrument circuit, by creating a continuous current flow, retains the double-wound line relay in the central office in its energized condition. Previously, when vertical impulses were passing, the line relay armature was released whenever the circuit was interrupted. When the next series of impulses are being sent, its armature will follow them in precisely the same way as it followed the series of vertical impulses, being released when the circuit is opened and operated when it is closed.

Each time that the armature of the line relay is released, however, it completes a path through a back contact for the energizing flow of current through the normally-open contact of a slow-acting relay, energized whenever the line relay armature is operated, and the winding of another slow-acting relay known as the "private control relay."

The first slow-acting relay, operated when the line relay is first energized, remains so without releasing its armature, although the energizing circuit through the contact springs of the line relay is being rapidly broken. Whenever the line relay is released, an impulse of current is sent through the winding of the private control relay via the normally-open contact (now closed) of the slow relay.

In this way, both the slow relay and the private control relay, are retained in the operated position as long as the line relay is responding to impulses and interruptions over the line circuit. The slow relay is energized when the line relay is first operated, and the private control relay is energized whenever the line relay is released, *provided the slow relay is in the operated position.*

1108. *Switch from vertical magnet to rotary.*—At the end of the series of impulses, the line relay is finally operated and is *not at once released.* As a result, the private control relay, which is energized by the flow of current through a back contact of the line relay, is released. The release of the private control relay completes a path for a flow of current through the winding of the "private magnet," and its armature is attracted.

Nothing happens until the second series of impulses begins, when the line relay is again alternately released and energized and the private control relay is again operated. When this occurs, the private magnet is again de-energized and through a very ingenious mechanical action switches the impulse-carrying circuit from the vertical switch magnet to the rotary. As the circuit is interrupted and re-established, the switch is operated in the horizontal plane by current impulses passing through the winding of the rotary magnet coils, 1 and 2, Fig. 284.

1109. *Mechanical operation of the rotary magnet.*—In Fig. 284, the rotary magnet is shown at 1 and 2. The lever by means of which the rotary magnet functions, is shown at 6. This lever is pivoted at 11 and is provided with an armature opposite the pole piece of the magnet from which it is separated by the air gap, 14. The pawl 8 is designed to engage the vertical teeth cut in the barrel of the switch shaft at 16.

When the rotary impulses are received, the vertical magnet has already raised the switch shaft to a point opposite the row of contacts into which it is to be driven. The shaft is held at this height by the double dog. With the first rotary step, the fixed dog—neither the double dog nor the fixed dog are shown in Fig. 284—takes up the task of preventing the shaft from dropping below the row, while the double dog acts as detent for the rotary stepping.

The effect of the alternate energization of the rotary magnet, 1 and 2, may be readily seen by examining the plan view *C*, Fig. 284. Obviously when the armature is attracted by the magnet, the lever will rotate around its pivot at 11 and the pawl, 8, will force the wipers around to the right, looking at the rear end of the magnet opposite the shaft. The complete rows of the switch banks comprise approximately one-third of a complete circle so that the wipers are driven about 120 degrees to reach the last contact in each row.

(*To be continued.*)

American Telephone Lines Constructed in France.

The Signal Corps of the U. S. Army in France has already constructed telephone lines in that country—part cable and part open wire—equivalent in length to the telephone line between Chicago and New York, according to the Western Electric News. The length of line has been increased as our troops advanced eastward and the consolidation of positions warranted the building of permanent lines.

Of course, the present system isn't just one straight line. It comprises main lines between important centers and ramifications to depots, ports, camps, etc. Like all American long distance lines, those in France are used for simultaneous telegraph and telephone transmission.

These lines will probably become a part of the French national system when our troops leave France.

Sundry Snapshots Along the Trail

Observations and Comments, Pertinent and Otherwise, On the Sunshine and Shadows of Telephone Work

By Well Clay

Th' day we heard we'd licked th' Hun
Y' bet y'r life us kids had fun.
We hollered as loud as we c'd yell,
Then we went an' ringed th' fire bell,
An' wasn't skeered f'r fear th' Cop
Would come along and make us stop.
Then we got th' old brass cannon out
In th' public square an' filled its snout
As full of powder as it could hang,
Then we let'er off-kerbang.
We all skipped school, I suppose y' know
Because we couldn't miss that show,
When all our folks was out in force
Yellin' theirselves t' death, of course;
We all were so glad th' war was done
And we had helped to lick th' Hun.

I suppose it was the same way all over America and probably in the countries wherein our allies reside. First a little telephone message came leaking in over the wires to some one in the town. Then that one spilled the news to his or her best friend, and by that time, Central had skimmed the news and, finding that it was public property, promptly beat most of them to it by announcing the news that the greatest war of history was over and the Germans licked to a frazzle.

Talk about a prairie fire spreading! That would be nothing to the way this news spread. Everyone who heard the news promptly took down his receiver —of course, most of them heard the news over the telephone—and called for their nearest friend or best German enemy and told the news; that is, when they could get Central to answer.

Central did try to answer, too, but with a full force of operators on the job, they were soon so swamped with calls that the board was simply one solid blaze of light. They were buried with calls, most of the subscribers frantically jerking their receivers up and down in a vain attempt to attract the attention of the operators. And then the long distance business took such a jump that the performance credited to the cow that jumped over the moon, was out of the running forever.

It seemed as though every second person wanted to call up some distant friend and tell the news. At the end of 15 minutes from the time the first little message came gliding in over the wires, the long distance business had to shut down completely, partly because the operators could not write the tickets—let alone send the messages—as fast as they came in, and partly because the wires were so jammed with traffic that it all but ceased altogether except for government calls, which, of course, had the right of way.

After about 30 minutes, the people became impatient and started out on foot towards the town's business center to see what they could find out in the way of detail. By this time, the rural lines woke up and within five minutes "every receiver was down." Inside of one hour most of the ruralites within ten miles of town were there and an impromptu Fourth of July was forthwith in full swing—only greatly intensified. The record was broken, but the people got the news even if the operators were half dead from the rush.

Most of you are familiar with the scenes that took place on Main street of your home town on that day so I need not go into that, except to relate an incident that happened here. In the midst of all the ear-splitting racket on Main street, an old German fellow who lived alone near the edge of town, finally arrived at the corner where things were the liveliest. As he had no telephone in his house, he was still in ignorance as to what all the noise was about. So he asked a bystander, who replied that the "War is over." After a minute or so, the German plucked up his courage again and asked: "Who von?"

Who won? What a question! And at what a time? Outside of the joke of this evidence of stupidity, the question of who won or, as it may be asked later, "What won the war?" may be answered that over and above any other one agency outside of brains and brawn, the telephone, first, last and all the time, won the war.

This question, of course, is of little interest just at the present moment when we will soon be "Looking for a letter that was mailed in Old Berlin" as I mentioned some few weeks ago. But as out of great tribulation comes great good and a clearer vision, so out of this war will come, as things clarify, a lot of good for many industries.

The air ship, now no longer needed on the battlefront, will soon be seen in large numbers over our great cities as they fly to and from the large centers of population, carrying passengers and mail—perhaps, in a measure, even merchandise. The submarine, greatly improved and enlarged, will dive under the ocean and emerge on the other side with multitudes of passengers who have thus been enabled to sidestep the discomforts of wind and waves during passage on the surface of a stormy sea.

It may be said, in passing, that the old familiar scene of some passenger donating his dinner to the fish "over the side" will not be a feature of the deep-diving submarines. Instead, the passenger, like Captain Nemo, can sit after dinner in a compartment wherein only a strong plate glass will separate him from the depths which are lighted to noonday brilliancy by electrics, and watch the passing undersea life as one would sit in a movie and watch the roll of the film. Whether he be a section of democracy, or not, he will be safe.

The tractor will blossom forth in multitudes, and the sturdy sons of the soil will guide them in their work of pulling stumps, hauling great loads, making roads, or any other heavy work. The boys will know how to make light work of any of these obstacles, because they are ripe in experience gained under the most adverse conditions, and will fit into the new order of things nicely.

All of these new wonders will soon become every-day objects to us and excite no comment, but each and every one of them will depend on one common helpmeet to keep them to work with the highest possible efficiency. That one thing is not gasoline, as you may think—but the telephone. Did you ever stop and think of that?

The airship must depend on the telephone—wireless. The undersea boat must depend on the telephone not only to guide her but that approaching obstacles, either moving or stationary, may be avoided. The telephone must be not only the ears of the ship but must supplement the eyes as well.

The tractor may not use the telephone continuously but it depends, nevertheless, on the convenience of the farmhouse telephone for replacing broken parts at times when delays are costly.

In fact, in this grand time which is only now opening up to the vision of those who have the faith and the love of mechanics, the telephone looms large in the plans which are soon to take shape on the trestle board of destiny. Others will discern them later, and ultimately all will. The war is over! The war is just begun!

It is hard to write about climbing poles and tying-in wires in a time like this —you would not read about it if I did confine myself to it. That is the reason, today, why I am holding the mirror of fact in such a position that it may reflect a little of the sunshine of opportunity into your eyes.

The old saying that all roads lead to Rome will have to give way to a newer and truer one for all occasions.

APHORISM: All hands reach for the telephone.

Cross-Talking and Cross-Ringing

Experiences in Exchange with Grounded Rural Circuits When Cross-Talk and Cross-Ringing Prevailed—Steps Taken to Locate Principal Seat of Difficulty—How Tests Were Made for Cross-Ringing—Other Conditions

By Hawley Barnes

Without taking issue, either with comments on this subject already published in TELEPHONY, or with those who hold that it is no use to try to do anything for grounded circuits until they are made metallic, I will give some experiences with an exchange where about 30 grounded farmer lines were satisfactorily operated under adverse conditions that but for financial reasons would have imperatively demanded a metallic system.

Operating Conditions.

The conditions were as follows: A strictly metallic two-party selective exchange in the town limits connected with the grounded lines of a farmer mutual company which were met at the town limits by the commercial company owning the exchange. Of the grounded lines, 29 came to the office terminal pole on one lead, branching off in different directions on the country roads until at a distance of about 2½ miles from the office. The heaviest farm lead carried about eight or nine circuits, and at the time these 29 lines were first connected to the switchboard, the cross-talk was sufficient to make the unfortunate operator "go straight up."

The rural lines had all been built within a year from new material, house-wiring soldered, good length of ground rods provided, and in every way things were in as good condition as it is possible for a farm line to be, all of which indicated the blame to be with the equipment of the commercial company.

In addition to the cross-talk, much complaint was made by rural telephone users that the noise from the operator's ringing with the pole changer on any one line rendered conversation impossible for the time being on all other rural lines. Simultaneously complaints of cross rings came from subscribers having telephones on metallic circuits within town limits.

Statements of these conditions to higher officials of the commercial company were met by the reply that nothing could be done which would remedy conditions, except to make the rural lines metallic. One said that a well-balanced common return, extended to the principal junction pole of the grounded portion of the system, might reduce the cross-talk a little but not enough to justify the expense.

For clearer understanding of what follows, it should be understood that switchboard had been installed and grounded circuits extended to meet rural lines at the town limits by a construction foreman and crew and turned over to the local force for operation.

The grounded circuits were brought to the office terminal pole on No. 12 galvanized iron wire and thence to the distributing frame in the office about 20 feet away on No. 18 outside jumper wire, rubber-covered, double-braided and weather-proofed. This wire was new, of best quality and, except for about ten feet where it crossed the sidewalk and was loosely laced together in the semblance of a cable, was fanned out enough to give plenty of air space between wires.

The No. 18 weatherproof wire terminated on a fanning strip carrying tubular fuses, on the upper half of the distributing frame from which cross-connection was made through "flameproof" cross-connecting wire to a fanning strip on the lower half of the frame which carried heat coils and carbon arresters and punchings for connection of the switchboard cables and cross-connections.

The circuit, of course, from this strip to the switchboard was metallic, the ground being made in the usual way by removing the micas between carbons on the sleeve side of the farmer lines. The fanning strips and distributing frame were provided with most ample ground connection.

First Step in Locating Trouble.

The first and obvious step in trying to improve service, was to install test connectors in one of the troublesome circuits and to locate the principal seat of the difficulty by isolating different portions of the circuit in turn and listening in both from the operator's position and with a test set. It was quickly apparent that a perceptible amount of cross-talk could be picked up on a grounded circuit extending only from the switchboard to the office terminal pole, whereas on a metallic circuit extending through the same bunch of No. 18 wires to a test telephone at the terminal pole, no cross-talk was in evidence.

It was also found that while most of the grounded lines in this bunch of wires consisted of single outside jumper wire, there were a few circuits coming in on twisted pairs, two grounded circuits in each pair, which would appear to have the same tendency as split pairs in a cable as promoters of cross-talk. It was promptly decided to make these farm circuits metallic from the board to the terminal pole through twisted pairs of the same kind of conductors, doing away with the single conductors and split pairs. This was done and the sleeve sides of the lines were grounded at the office pole. The reduction of cross-talk by this means was less than hoped for and probably was not very noticeable except to the optimistic ear of the fellows who did the work.

There was no cessation of complaints of cross-ringing, and with the coming of an exceedingly wet rainy spring and the installation of more telephones on most of the rural lines, the cross-talk was there as much as ever, save that it seemed to be aggravated on wet, foggy days.

Alleged switchboard men sent in response to representations to headquarters came, made various alterations in the wiring of the selective ringing key used in connection with the two-party lines and pronounced the balance of equipment O. K. They took their departure after explaining that excessive cross-talk was an inseparable adjunct to grounded lines and dealing out a line of talk concerning wave shape and frequencies and poorly-designed pole changers being responsible for excessive noise on lines parallel to circuits carrying ringing current, all of which was interesting, and, to an ordinary bug hunter, confusing, and didn't lead anywhere in particular.

Not believing that sufficient current could be thus induced in an adjacent circuit to actuate a ringer movement, no matter how faulty the pole changer design might be, the local bug hunter took out a further search warrant for the cause of the cross-ringing. He reasoned that if ringing current could leak out from any given circuit to an adjacent one, some of the same current applied externally to the defective insulation, if such there was, would be pretty apt to leak back.

Test for Cross Ringing.

To do this, an ordinary extension bell was given a very close adjustment, so that a very slight amount of current would ring it. It was placed in series with the alternating current side of the pole changer, and a piece of wire with a free end for exploring purposes.

Application of the free end of the wire to the switchboard cable end to various

portions of apparatus, when isolated for the purpose of testing, brought no results, but on turning to the distributing frame to continue the search, the bare end of the exploring wire happened to brush against the bunch of "flameproof" cross-connecting wires running between the two fanning strips. Jingle went the extension bell—and the mystery was solved.

Further observation developed the fact that this particular coil of 1,000 feet of "flameproof" had a remarkable affinity for moisture—so much so that even with all doors and windows closed and a fire going in the office stove, the saturated cotton braid would rapidly absorb moisture on a damp day so that it was moist to the touch and while in that condition very conductive.

The frayed thread ends of the braid where the wire had been skinned off for soldering to the punchings on the arrester strips, were touching the ground side of the arrester strip and also were, of course, in contact with one another, in this way producing partial grounds and slight wet crosses at this place.

First aid to the injured consisted in getting a big kerosene lamp placed under the frame to dry out the moist and well-named "flameproof" and then with a sharp penknife removing the braid, leaving the rubber insulation exposed for about an inch back from the punching at each end of the cross connecting wire. In this way the possibility of partial grounds or crosses through the medium of this braid was eliminated.

Another 1,000-foot coil of flameproof wire of the same kind and make was then tested and found to be free from any affinity for moisture and was consequently used to replace the cross-connections previously made. Indeed, both in my own experience, and in visiting other exchanges where this same kind of equipment was used sometimes in proximity to windows which were left open on damp, foggy days, I have never found another lot of this kind and make of flameproof wire to show the same tendency to absorb moisture.

Occasional cross-ringing which still occurred between some of the metallic two-party circuits, was found to be due to defective insulation on a few turns of the drop winding, allowing contact with the drop shell thence to the iron mounting strip, and then through one side of the night bell circuit to another drop similarly defective.

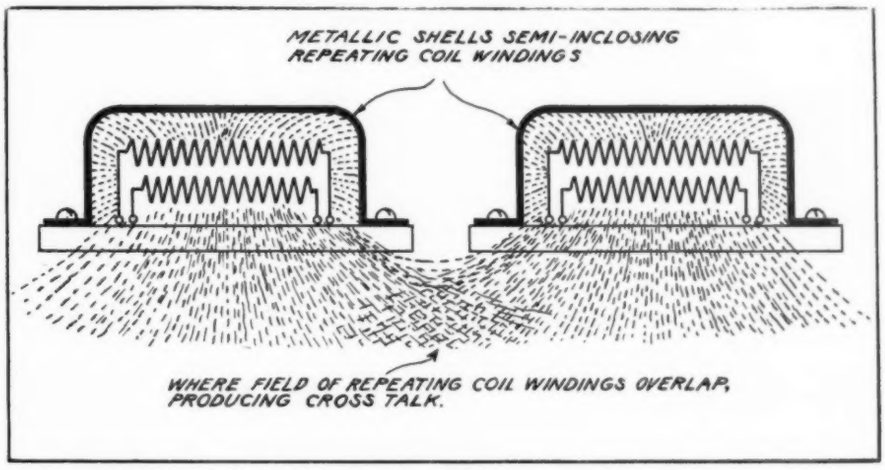
This was tested out simply by using a receiver in series with four or five good cells of dry battery connected to a couple of pieces of wire for exploring purposes. One terminal being placed in contact with drop shell and the other with the winding, exposed the defective drops which were replaced with good windings, clearing the trouble.

The switchboard in this exchange had two cord pairs equipped with repeating coils arranged so that they could be looped into circuit by means of an extra key lever placed beside the listening key. These were intended for use in giving toll connections between metallic long distance lines and grounded farmer lines. Other cord circuits were provided with double clearing-out drops with repeating coils and condenser in each cord pair—a plan which has manifest advantages in magneto boards under certain conditions.

The reason for their use in connection with this board was the necessity for giving connection between farmer lines and the selective party lines in the town portion of the exchange, which, with the ordinary cord circuit, would have led to difficulties by reason of parties ringing off on farmer lines and thereby ringing the party on the metallic line not concerned in the connection. In this connection it should have been stated that the selective scheme was the simple one of the subscriber's generator bridged on the metallic circuit, and the subscriber's bells, one on each side of circuit to ground, ringing with alternating current. The arrangement of cord circuits with double clearing-out drops gave other operative advantages which, however, have nothing to do with the troubles being described.

It was found on trial that when a number of connections were up through cord circuits, by opening the listening key of a cord pair not in use or connected to any line, a faint but distinct cross-talk between cord pairs could be heard. This was readily proved to be due to the close proximity of the repeating coils to one another, by freeing one of them from its attachment to the switchboard frame and moving it to and from its neighbor while listening in on that particular pair. The inductive effect diminished as the separation increased, ceasing to be perceptible when the repeating coils were about six inches apart.

As space did not permit mounting these coils so far apart, the expedient was tried of taking some heavy sheet iron of No. 14 gauge, slightly larger than the base on which each coil was mounted and flanging up the edges so as to make a shallow iron box in which to mount the coil as shown in the accompanying sketch. While not as neat a job as the manufacturer would have done, it answered the purpose and cleared the trouble. Where the fields of the repeating coil windings overlapped, as shown in the sketch, producing cross-talk, another piece of sheet iron was shaped to completely enclose the winding of each coil.


METALLIC SHELLS SEMI-INCLOSING REPEATING COIL WINDINGS
WHERE FIELD OF REPEATING COIL WINDINGS OVERLAP, PRODUCING CROSS TALK.

Repeating Coils Semi-enclosed with Sheet Iron to Prevent Cross-talk.

As a further step in the elimination of cross-talk between grounded lines, I took one of the farm circuits which branched off from the main lead at a distance of about a mile from the office and made it metallic to the junction pole outside the town limits and grounded the sleeve side there instead of at the office. The result was all that could be asked for, both in the freedom from cross-talk and also from disturbance occasioned by a high-voltage street lighting circuit which bothered other grounded lines on the same lead.

I did not get to experiment further along this line because of the expense, but am firm in the belief that had I been able to have made certain selected lines metallic through all or even a portion of their length, it would have much improved the service even for those lines not so dealt with. It is obvious that where two grounded lines run parallel thereby producing cross-talk, the making of only one of them metallic and carefully transposing, will clear the cross-talk and improve the service for both, insofar as those two circuits are concerned. Therein is a hint for those managers who desire to improve their farm line service but are unable to undertake to rebuild their entire system on a metallic basis.

I do not believe that all of the conditions referred to were unique or peculiar to the exchange of which I happened to

be in charge. In fact, I find some of these conditions existing almost everywhere I go, and they are either unknown to the management or taken as a matter of course like death and taxes. Taken as they run, it is safe to say that the condition of the average grounded farmer line circuit can be improved 50 per cent in less than a mile from the office.

Iowa District Meetings.

The Iowa Independent Telephone Association has announced four district meetings to be held during the coming week.

The first one will be held at the Brazelton hotel, Mt. Pleasant, Iowa, November 18. The following day, November 19, a meeting will be held at the Commercial Club Rooms, Albia; the 20th, at the Creston Club Rooms, Creston; the 21st at Denison, and the 22nd at the Commercial Club Rooms at Le Mars, Iowa.

Several other meetings will be held in the near future and the dates and places will be announced as soon as final arrangements can be made by Secty. Chas. C. Deering.

Reserve for Accrued Depreciation

Lincoln Telephone & Telegraph Co. and Nebraska Railway Commission in Dispute as to Purpose of Depreciation Reserve, Arising from Debits to That Account in Consolidating Properties Purchased—Commission's Objections to Procedure

The Lincoln Telephone & Telegraph Co. and the Nebraska State Railway Commission are in dispute over a proposition that will interest other telephone companies. In its liability items the company has listed two items, "reserve for accrued depreciation" and "corporate surplus unappropriated," aggregating $1,007,-152.73, but the commission says that this does not represent a dollar of surplus derived from rates as a surplus should.

The "reserve for depreciation" account has been credited from the beginning of the business with $1,482,693.51 taken from the revenues, whereas it has been debited with $1,731,152.97 expended for replacements of worn-out equipment and for consolidation of purchased plants with original properties.

The credit balance now in this account came about entirely from debits to "corporate surplus unappropriated" account in the sum of $674,020, and other items including one from surplus credit balances of properties purchased. Its history is substantially as follows, according to Commissioner Wilson:

In 1912 the company purchased all of the exchange and toll property of the Nebraska Telephone Co. located in the territory now served by the Lincoln system. After taking possession of the property, it made an inventory and reproduction new value of all of its property and arrived at a figure in excess of the cost to it of the property of $1,137,948, which it credited to "corporate surplus unappropriated" account. Subsequent credits and debits were made, the latter including $674,000 to the "reserve for accrued depreciation" account, dividends, bonds and stocks redeemed and losses incurred in the sale of property measured by its book value. The balance is $454,000.

Mr. Wilson insists that the purpose of a depreciation reserve is solely to replace wornout property in kind. The use of such reserves for consolidating properties he holds to be illegal, therefore. consolidation costs, he argues, should come out of capital the same as plant costs, as the presumption is that they were taken into account in fixing the purchase price of properties acquired under those circumstances. In the recent order raising rates for emergency purposes, he condemns this practice and in his order sought to provide against its continuance.

Mr. Wilson admits that consolidation costs may not be charged to capital in cases where it will result in a greater charge to capital than the value of the plant. Application should be made to the commission, he says, in such cases for a valuation of the property after consolidation and a determination of the amount properly chargeable to capital, and should a deficit arise in a proceeding of that character, it would appear that it should be charged to common stock dividends account, as an injudicious investment.

The company's expenditures for consolidating purchased properties with those formerly owned by it were made largely in the years 1913, 1914 and 1915 and is reflected in the following relation between its expenditures for repairs, replacement and consolidation and its plant values from the beginning in 1912 down to date, to-wit: 1912, 4.25 per cent; 1913, 8.63 per cent; 1914, 8.82 per cent; 1915, 7.97 per cent; 1916, 7.23 per cent; 1917, 7.42 per cent; 1918, 7.8 per cent.

The commission, in the rate increase case, held that only the percentages of the last three years may safely be taken as a measure of its needs for maintenance and depreciation, and they are vitiated somewhat by the inclusion of consolidation costs. It added these observations:

"The commission noted during the hearing that the company was using a basis for charges to the depreciation reserve fund on account of replacements which gave results at variance with the purpose of the fund, as the commission views that purpose. The basis used is the cost to the company (or to its predecessor in the case of purchased plants) of the particular item of equipment replaced, the cost being estimated for the most part because of incomplete records as to original costs. The difference between this cost and the company's expenditure in making the replacement is debited or credited to plant account, according as it is above or below the cost of the property displaced.

"The result is a fluctuating plant account compared with the extent of property and service and a corresponding fluctuation in the amount of return due applicant on the value of property basis. It also introduces a highly disturbing factor in physical valuation proceedings as it is impossible for the engineer to inventory replacements separately from the original property yet in place or according to time of instalment. The basis is also not in accordance with the purpose of a depreciation reserve fund which is to replace wornout or obsolete property in kind regardless of the cost.

"Credits are made to this fund from revenues with the idea of fully maintaining the plant in good operating condition. Permanence of service can be secured in no other way, as private capital with which to make repairs cannot be secured where the capital account is already full. At least capital cannot be secured for that purpose where the facts are known. The law also recognizes the obligation of maintaining the property ahead of owner's return, as a public utility is not permitted to pay dividends without making ample provision for this purpose.

"Applicant will, therefore, be required to charge to its depreciation reserve the entire cost of replacements in kind. Where not made in kind the charge shall be the estimated present cost, or reproduction new value of the property displaced, and the difference between that cost and the cost of the property installed shall be debited or credited to plant account as the case may be, due allowance being made for all salvage value in the displaced property."

Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchises, Rates and Service

Asks to Issue Stock Dividend for Past Sacrifices.

The Farmers & Merchants' Telephone Co., of Alma, Neb., has applied to the Nebraska State Railway Commission for authority to issue $18,000 worth of stock dividends. The president and largest stockholder is R. L. Kesster, of Alma. In a rate case decided last April the commission refused to allow the company to earn dividends on all of its company-owned building, declaring that the total investment made was not necessary for the business.

Mr. Kesster now asks that $19,667 stock be issued to present stockholders to represent their investment in the building and grounds, and that the company be authorized to issue to those stockholders and officers shown to be entitled to it, by reason of past sacrifices, the remainder of the company's surplus of $33,123, less whatever the commission decides is necessary as a depreciation fund.

Mr. Kesster recites in detail the history of the company, and of the necessity that finally arose for him to devote first half of his time and later all of it to the business. For the early years he did not draw any salary because all of the excess above operating expenses and other fixed charges went into the property in order to meet the demands for the extension of facilities. He wore out several teams and carriages that he did not charge up against the company.

No dividends were paid by the company for the first three years, 5 per cent for the next two years and 10 per cent for one year. Since then it has paid but 6 per cent. The stock issued the first year was $1,175, and the total authorized and issued at the present time is $16,012.

The applicant figures his sacrifices at $10,119, profits from investments and purchases by the company, $3,072.91, and dividends not paid $4,757.14, a total of $17,949.50. This money went into the property and was never withdrawn or capitalized. He thinks it should be, under the rules laid down by the commission when it passed upon the rate application six months ago. He said that the company had depended upon the previous holding of the commission that rate-making was based upon the physical value of the property.

One of the profits from investments that he includes consisted of $545 made on an investment of $25. Before the war broke out in Germany he bought from the Nebraska Telephone Co., which had had thrown back on its hands material and instruments that a local company had purchased when it sought to institute competition in Alma against the Kesster company. Later he removed the platinum and German silver from the instruments, for which he had paid $25, for a total of $573, due to the great increase in price.

Nebraska Commissioners to Confer with Postmaster General.

Postmaster General Burleson has signified to the Nebraska State Railway Commission a disinclination to litigate the question of his jurisdiction and power to impose the service connection charges within the state of Nebraska. The commission filed suit several weeks ago in the federal court for Nebraska, asking for a permanent injunction restraining the Lincoln Telephone & Telegraph Co. from imposing or collecting these charges. In order not to embarrass the company and as only a law point was involved, the commission did not ask for a temporary injunction. This permitted the case to come up in turn, after issues had been joined.

Several days ago Frank H. Woods, president of the Lincoln company, called the commissioners from New York. He said that he had just returned from a conference with Mr. Burleson, and that the latter desired to have a conference with the commissioners before proceeding any further with the litigation. He believed that a personal conference would result in ironing out their differences, and that it would be necessary to go to the legal mat over the proposition of jurisdiction and control.

At his request, the commissioners signed a stipulation allowing the defendants 30 days more in which to file their answers in the case. Meanwhile, Commissioners Taylor, Hall and Wilson have gone to Washington, where they will see Mr. Burleson some time during the sessions of the National Association of Railway Commissioners.

All three commissioners say they are prepared to defend in the courts their rights to determine what service connection charges will be made on exchanges located within the state of Nebraska, and that their experience and investigation have convinced them that the charges put into effect on the order of Mr. Burleson are unreasonable, excessive and not justified by the cost.

They insist that no such power as the Postmaster General has exercised in the matter was lodged with him by the act of Congress under which he took over the wire communication systems of the country.

Sale and Merger of Properties at Wenona, Ill., Approved.

The Central Illinois Independent Telephone Co., having its principal office in Rutland, Ill., and exchanges at Wenona and Lostant, has been authorized by the Illinois Public Utilities Commission, in an order issued October 28, to purchase the properties of the copartnership operating in the city of Wenona and vicinity as the Wenona Telephone Co. for the sum of $10,173 and merge the plant with its system.

It was shown by the petitioners, at the hearing, that the system operated by the purchaser in Wenona is now serving approximately 265 stations, and that the system operated by the seller is now serving approximately 263 station. It was also shown that, of the stations served by the two systems, approximately 66 are connected to both, making a net gain for the purchaser, in stations, of 197, after the two systems are consolidated.

The record shows also that there is no interchange in service between the two systems at present, but that the service furnished by the seller predominated in the rural portion of the community and that furnished by the purchaser in the city. For this reason, the commissioner is of the opinion that a consolidation of the two telephone systems, by producing a substantial increase in the number of accessible telephone subscribers, will be a great convenience to the social and business interests.

Evidence shows that a consolidation of the two telephone systems in Wenona will also result ultimately in greatly improved and more efficient service, with a substantial aggregate saving to those subscribers who are compelled to maintain connections with both systems.

The Central Illinois company is authorized to issue its common capital stock in the amount of $1,660 to be used as part payment for the purchase price of the Wenona telephone property, the balance to be paid in cash.

Stock and Bond Issue for Rehabilitating Plant Approved.

The National Telephone & Electric Co., of Clinton, Ill., is authorized by the Illinois Public Utilities Commission, in an order handed down October 28, to issue $225,000 in 7 per cent preferred stock, $12,000 par value of 6 per cent first mort-

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gage gold bonds, each bond bearing the date as of January 1, 1915, and maturing January 1, 1935, and $100,000 par value of second mortgage 6 per cent gold bonds, dated as of January 1, 1918, and maturing January 1, 1935.

The company finds it necessary to make replacements, additions and extensions to its Clinton, Farmer City, Mansfield, Weldon, Kenney and Waynesville city and rural plants, necessitating a total expenditure of $359,815, displacing plant valued at $63,467. In the plant so replaced there is an estimated salvage value of $9,500, making the net expenditures $350,315. Of this sum $53,967 is chargeable to depreciation and $296,348 to capital account.

After giving due consideration to the evidence offered and exhibits filed at the hearing in the case, the commission is of the opinion that the issuance of the stock and bonds, as given above, is reasonably necessary to secure funds with which to rehabilitate its plants, in accordance with the estimates submitted, and to prevent a breakdown of the telephone service in the communities in which it operates.

It is ordered by the commission that the plant and equipment accounts of the petitioner shall be reduced by crediting thereto the sum of $53,967, the accrued depreciation at the present time; that "Other Debit Accounts" shall be concurrently charged with a like amount, which amount shall be amortized out of the income of the company over a period of 20 years by a charge to "Other Maintenance Expenses" each year of an amount equal to 1/20th of the total amount.

The company is required to retire and cancel each year outstanding stock or bonds, or both stock and bonds, equal to 1/20th of $53,967. It is not required, however, to retire and cancel stock or bonds to the extent that expenditures are made for new constructions, extensions, improvements or additions to its property, during such year (other than those expenditures included in the rehabilitation plan submitted in this case.)

The $12,000 par value first mortgage 6 per cent gold bonds are of the unissued portion of the $100,000 par value first mortgage 6 per cent gold bonds authorized by the commission's order No. 3274.

Rate Increase to Blue Mound (Ill.) Telephone Co.

Permission was given the Blue Mound Telephone Co., of Blue Mound and vicinity, by the Illinois Public Utilities Commission, to put into effect a new schedule of rates which, it is estimated, will yield a return of 5.8 per cent upon the investment. The proposed rates would have increased the revenues to 8.4 per cent but the commission held that they were not justified.

The new rate schedule which supersedes the present rate of $15 per year for all classes of service is as follows:

	Per Year.
Business, individual line, stations	$21
Residence, individual line, stations	18
Business or residence extension telephone stations	6
Extension bells	3
Extra Mileage:	
For line extending beyond established exchange area, four-party, each quarter mile or fraction thereof, per line	2
Rural, individual line, business stations	21
[illegible] multi-party line, stations	15

The commission also ordered the company to set aside a sum equal to 6.7 per cent of the cost to reproduce the entire physical property, based upon an average for labor and material for a five-year period, 1912 to 1916, inclusive, as a reserve against depreciation.

$34,970 was found by the commission to be a fair value of the property used and useful in furnishing telephone service in Blue Mound and vicinity, as of April 16, 1918.

The company operates a magneto system of about 470 stations, with metallic circuits to the subscribers' stations.

Infringement Suits Involving Validity of Patents.

The word "sell," in a contract settling infringement suits between two companies involving validity of patents for wireless telegraph or telephone inventions, whereby each party was to pay the other a percentage of the selling price of apparatus which it might sell, was held by the court to include a contract to sell.

A contract settling litigation over patents, and whereby a party acquired the right to use over 100 patents, and was bound to pay a flat royalty on each set of apparatus sold, without any apportionment of such royalties, is not so separable as to permit a finding of failure of consideration as to two patents afterwards held invalid.—International Signal Co. vs. Marconi Wireless Telegraph Co.; Court of Chancery of New Jersey; 104 Atlantic 378.

Local and Rural Rates at Dassel, Minn., Increased.

The Dassel-Collinwood Telephone Co., on November 9, was given permission by the Minnesota Railroad & Warehouse Commission to increase its local and rural rates as follows: Individual line business telephones, from $1.75 to $2 per month; individual line residence, from $1.25 to $1.50; and rural multi-party lines (company owned), $1.25 per month.

The company was incorporated and began operating in 1904, and at the present time has stock outstanding to the value of $12,000. The telephone property of the company has an appraised structural value of $22,586. The company serves 41 business and 131 residence telephones within the village of Dassel and 214 rural telephones in the rural district adjacent to that village.

The exchange at Dassel is a magneto exchange, aerial cable being largely used for distribution. Full metallic service is being furnished to all village and rural subscribers.

Rate for Rural Service at Franklin, Minn., Increased.

The Minnesota Railroad & Warehouse Commission, on November 9, granted permission to the Franklin Local & Rural Telephone Co. to increase its multi-party rural rate at Franklin from $1.25 to $1.50 per month.

The company operates a local magneto exchange at Franklin, Minn., and rural lines in the vicinity thereof, serving a total of 282 stations. The outside construction in the village is entirely aerial cable and all rural lines are full metallic.

The commission finds that the company has found it necessary to materially increase the wages paid to the operators and men used for maintenance work; that this item of expense, together with the increased cost of material, makes an increase in revenue to the petitioner necessary.

The commission further finds that the proposed rate is a fair and reasonable rate and will not produce more revenue than is necessary to pay the operating expenses, provide for depreciation and a fair return on the investment.

Nebraska Bell to Increase Exchange and Toll Rates.

The Nebraska Telephone Co.'s application to increase toll and exchange rates a flat 20 per cent was denied by the state railway commission, but an order was issued permitting an increase of 10 per cent on exchange rentals and 25 per cent on tolls. The commission believed this to be a more equitable distribution of the added burden it found necessary.

The new rates are to continue for six months. At the end of that time the old rates will be automatically restored unless the commission otherwise orders before that date. The toll rates became effective November 1, but the new exchange rates are not collectible until December 1. The hour at which night rates go into effect is to be 9 o'clock instead of 6 o'clock.

The order further requires the company to so keep its books that each exchange shall stand upon its own record, and also that before May 1, 1919, the company shall make full proof that the exchange rates are reasonable and justified.

The commission estimates that the new rates will produce an increase in tele-

phone rentals of $221,185, and in tolls of $210,858. Of the total additional revenues of $432,043, the sum of $350,000 is to be expended in taking care of increases in salaries and wages, $80,000 is for increased federal taxes and the remainder to cover increased cost of materials.

The Nebraska company's showing was that it was steadily losing many of its skilled workers, some of them to the federal railroad administration, through the lure of higher wages and that it would have to increase wages at least 25 per cent in order to retain most of those in its employ or induce others to take service with it.

The revenues of the Nebraska company during the past year were $3,131,000. These will be increased to $3,563,000 by the new schedule of rates. It was stated by the commission that these new rates are not to go into effect until approved by the Postmaster General, who declined to permit the company to increase its wage scale until the higher rates had been authorized by the commission. This approval, however, is expected to be a mere formal matter.

The order provides that the company shall not pay any higher dividend than it has been paying, which is 7 per cent on the common stock. It has no other kind of stock and no bonds, but its statement shows that it owes the American Telephone & Telegraph Co. a large sum, approximately $5,000,000 for borrowed money, upon which it pays 6 per cent.

In the Lincoln Telephone & Telegraph case, decided a week before, the commission ordered that that portion of the property investment represented by the $1,200,000 bonds and the $4,000,000 special preferred stock, should not earn more than the 5 per cent rate the money costs the company, but in the Nebraska case it made no direction as to the 6 per cent borrowed money, on the theory that the rate was likely to be advanced in the condition of the money market.

The property of the Nebraska company is valued at $13,124,000. It consists of 96 exchanges, and 89,000 telephones are operated. Of this number 46,000 are located in the Omaha city zone. The present rates in Omaha are: For city service only: Individual business, $6 a month; two-party, $4.50; individual residence, $2.50; two-party residence, $2. For zone service: Individual business, $7; two-party business, $5.50; individual residence, $3 and two-party residence, $2.50. These will be increased a flat 10 per cent.

Power Line to Select Other Route to Avoid Interference.

Permission to construct and operate a 13,000-volt electric transmission line extending from Fairmount to Lyons was granted by the Illinois Public Utilities Commission to the Homer Electric Light & Power Co., but it was ordered that the line be constructed along some other route than the one proposed so as not to cause interference with the circuits of the Central Union Telephone Co., the Vermilion County Telephone Co. and the American Telephone & Telegraph Co.

Objection was raised to the construction of this transmission line by the Central Union Telephone Co. on the ground that it would parallel for a distance of seven miles and cause inductive interference with its toll circuits between Fairmount and Lyons, which also carry circuits of the Vermilion County Telephone Co. and the A. T. & T. Co.

From the testimony taken at the hearing the commission was of the opinion that public convenience and necessity required the construction of the transmission line in question and to this the objectors raised no contention. It appeared, however, that to construct the transmission line along another route designated as the "South Road" would involve the construction of three additional miles of pole line and that the additional cost would be in the neighborhood of $3,000 at the present time. This cost might later be increased by $1,000 if it should be later desired to make this transmission line a three-phase instead of single phase system.

General Order No. 30 of the commission establishing rules for overhead electrical construction states: "When new lines are projected which will parallel existing lines of other utilities on the same street, highway or alley, the new construction shall, unless joint construction is used, be located, where practicable, on the opposite side of the street, or other way, from that occupied by the existing lines, or be routed elsewhere if a second route is available."

"In dealing with cases of possible or actual interference between supply lines and signal lines," the commission recites in its opinion, "each individual case must be handled separately for the reason that conditions differ so widely, and it was for this reason that the rules of the commission (General Order No. 30) laid down certain fundamental principles rather than enter into detail specifications for line construction of this character in which these difficulties were involved.

It might be said that all cases of inductive interference might be avoided through the selection of other routes for the second line whose construction would bring about the interference, since it is obviously possible in any case which might be conceived, to locate the route sufficiently removed from the initial line to obviate the difficulty. Apparently such a holding of general character would be unjust and unreasonable since it would oftentimes cause extreme lengths of line and unwarranted expense.

The additional construction involved in this case, should it follow the route known as the 'South Road,' would cause some inconvenience on the part of the transmission company and added expense to the amount of $3,000 or $4,000 and possibly some operating losses due to the additional length of line involved.

The results which would be gained would be the entire elimination of the probability of telephone interference with telephone circuits of considerable importance which are engaged in rendering service to citizens through this community. Broadly speaking, these same citizens, through additional rates paid for electric service, would necessarily be called upon to pay the increased operating expense and fixed charges involved in this construction. The problem is, therefore, one of selection as to the construction which will best serve the public.

The commission having considered the petition herein, all testimony adduced, and the representations and arguments made, finds, that public convenience and necessity require the construction of a transmission line extending from Fairmount to Lyons as herein proposed but that the said transmission line should not be constructed along the route designated herein as the 'North Road,' which route is that at present occupied by toll circuits of the Central Union Telephone Co., the American Telephone & Telegraph Co. and the Vermilion County Telephone Co. jointly, but should be constructed along some other route which will not cause interference with these said circuits."

Schedule of State Commission Hearings and Summary of Rulings.

ILLINOIS.

October 28: The Central Illinois Independent Telephone Co. of Wenona and Lostant is authorized to purchase properties of Wenona Telephone Co. for sum of $10,173 and to merge the plant with its system. No. 8244.

October 28: The commission approved the intercorporate contract between the Central Illinois Telephone Co. and the Farmers Mutual Telephone Co., covering the handling of toll messages between the system of the Farmers' Mutual and the combined telephone systems in Wenona, approval of the consolidation of which is given in order No. 8244; also covering the establishment of a preferential tariff on toll messages between points reached by the Central Illinois system and connecting companies, except Wenona, and the system of the Farmers' Mutual at Lostant, No. 8243.

October 28: The commission authorized the Stark County Telephone Co., of Toulon, to issue its common capital stock in the amount of $6,200 to be used in retiring a like amount of stock issued about February 1, 1916, without the consent of the commission. No. 7875.

October 28: The Kempton Telephone Co. was cited to appear before the commission at its Chicago office and show cause why its lines and equipment should not be placed in a condition to render adequate and satisfactory service. No. 8671.

October 28: On June 5, 1918, the com-

mission suspended the proposed rate schedule of the Carroll County Independent Telephone Co., of Savanna, Ill., and vicinity, until October 28, pending hearings as to the propriety of the increased rates. The hearing has not been concluded, nor any decision rendered. The commission, therefore, finds it necessary to extend the time of suspension to April 28, 1918, and so orders. No. 8215.

October 28: The commission suspended the proposed rate schedule of the Galva Telephone Co., of Galva, until March 30, 1919, pending an investigation as to the reasonableness of the proposed rates. No. 8633.

October 28: The commission suspended until February 28, 1919, the proposed rate schedule of the Tri-County Telephone Co. for the city of Mount Vernon, pending a hearing concerning the propriety of the proposed rates. No. 8552.

October 28: The commission suspended the proposed rates of the Martinsville Telephone Co. for the city of Martinsville until February 28, 1919, pending a hearing as to the reasonableness of the proposed rates. No. 8577.

October 28: The proposed rates of the Mississippi Valley Telephone Co. for the telephone service in villages of West Point, Basco and Sutter, and vicinities, are suspended until April 30, 1919, pending an investigation as to the propriety of the proposed rates. No. 8634.

October 28: The commission authorized the Virden Home Telephone Co. to increase its telephone rates in Virden and vicinity. No. 8129.

October 28: The commission authorized the Blue Mound Telephone Co. to increase its telephone rates in Blue Mound and vicinity. No. 8167.

October 29: The Lanark Mutual Telephone Co., of Lanark, was authorized to issue its capital stock to the amount of $3,000. Of this amount of stock $390 is to be used to retire a like amount of stock issued without the consent of the commission and the remaining $2,610 to reimburse the company's treasury for moneys used for construction, extension, improvement of, or additions to its telephone facilities during the years 1914, 1915, 1916 and 1917. No. 8173.

October 29: The commission authorized the National Telephone & Electric Co., of Clinton, to issue $225,000 in 7 per cent preferred stock, $12,000 par value of 6 per cent first mortgage gold bonds and $100,000 par value of second mortgage 6 per cent gold bonds to carry out its rehabilitation plan, as submitted to the commission. No. 8229.

October 29: Application of the Virden Home Telephone Co., of Virden and vicinity, to increase rates, granted. New rates will yield a return of 5.3 per cent. No. 8129.

October 29: Blue Mound Telephone Co., of Blue Mound, Ill., and vicinity, authorized to put into effect a new schedule of rates which, it is estimated, will yield a return of 5.8 per cent on the investment. No. 8167.

November 12: Case reopened and set for further hearing at Chicago on this date in the matter of the complaint of the Telepost Co., of Illinois, in regard to the refusal of the Chicago Telephone Co. to give wire connection to connect with lines of the Interstate Independent Telephone Co. of Aurora. No. 7125.

November 12: Hearing at Chicago on supplemental application for modification of original order in the matter of the application of the National Telephone & Electric Co., of Clinton, for permission to issue its second mortgage loan 6 per cent gold bonds in the aggregate amount of $100,000, substituting May, 1918, for sale of the bonds authorized for January 1, 1918. No. 3274.

November 12: Hearing at Chicago in the matter of the proposed advance of telephone rates in Keithsburg county by the Keithsburg Telephone Exchange. No. 8613.

November 12: Rehearing at Chicago in the case of Myer J. Stein vs. Chicago Telephone Co., on complaint of unreasonable and discriminatory charges for telephone service and for reparation in the amount of $240 overcharge; commission's original order reversed by Sangamon county circuit court. No. 8630.

November 12: Hearing at Chicago on the application of the Galva Telephone Co. for increase in rates in Galva and vicinity. No. 8633.

November 12: Hearing at Chicago on the citation of the commission ordering the Kempton Telephone Co. to appear and show cause why its lines and equipment should not be placed in condition to render adequate and satisfactory service. No. 8671.

Minnesota.

November 9: The Dassel-Collinwood Telephone Co. is given permission to increase its local and rural rates at Dassel, effective December 1.

November 9: The Franklin Local & Rural Telephone Co. is given permission to increase its rate for rural telephone service at Franklin from $1.25 to $1.50 per month.

Nebraska.

November 2: Application of Farmers' & Merchants' Telephone Co., of Julian, for increase of rates on all classes of service from $1 to $1.50 a month. Commission finds that company is entitled to an increase of rates, but suggests that it apply for a schedule of rates in which there is a spread between business and residence charges.

November 4: Application of Farmers' & Merchants' Telephone Co., of Alma, for permission to issue a stock dividend of $18,000 in order to repay officers and stockholders for sacrifices of salary and dividends covering a period of years. Money went into plant.

November 4: Application of Bassett-Springview Telephone Co. for leave to increase rates 25 per cent. The company's showing is that it has not earned any dividends in the past. Its lines run through a sparsely-settled section of the sandhill portion of the state.

November 5: Application of Thedford Telephone Co. for increase of rates; company authorized to charge $2 per month for business telephones and $1.50 for residence and farm telephones. It was also given permission to charge 10 cents per call to non-subscribers, but was ordered to discontinue practice of charging 15 cents for delivering toll messages to subscribers. The company was dormant for several years, and has attempted, on an exchange of 46 subscribers, to operate on a gross revenue of not more than $80 a month.

November 6: Complaint filed by W. W. Corneal, of Pawnee, against the Pawnee Telephone Co., alleging poor service, an out-of-date switchboard and bad system of drops. The complaint was filed after the company had refused to reduce his bill because service had been poor.

November 6: Complaint filed by J. A. Singhaus, of Tekamah, against Nebraska Telephone Co., alleging delays in giving toll service.

November 7: Complaint filed by several subscribers against Guide Rock Telephone Co. that they are unable to get telephones when ordered.

November 7: Complaint of Charles Huffman filed against Pierce Telephone Co., alleging that the latter refuses to furnish service. He has organized a farm line company and desires connection.

November 8: Application of Palisade Telephone Co. for permission to increase rates. Company authorized to put into effect the following schedule: Where subscribers own telephone, for business service, $1.75; for residence, $1.25; for farm lines, $1.25; where company owns telephones, $2 for business; $1.50 for residence; $1.50 for farm telephones; 70 cents for switching where company owns farm telephones, payable quarterly in advance; 45 cents where company owns telephones. The application of the company was for $2 for business and $1.50 for residence and farm company-owned telephones and 50 cents a month for switching. It has been charging $1.50 for business, $1 for residence and farms and 35 cents for switching.

November 8: Hearing on application of Firth Telephone Co. for a flat increase of 25 per cent on telephone rates now charged. Its present rates are $1 a month. This was the first of a series of such hearings the commission has agreed to hold on the application of small Independent telephone companies for similar increase granted the two big companies of the state, the Lincoln Telephone & Telegraph Co. and the Nebraska Telephone Co.

November 19: Hearing at Scribner on application of Farmers' Telephone Co. of Dodge county for an increase of 25 cents a month and the elimination of free service between the exchanges at Scribner, Dodge, Snyder and North Bend.

November 19: Hearing on application of Kenesaw Telephone Co. for permission to increase business rates 50 cents a month and residence rates 25 cents, and also to issue $7,000 worth of new stock to pay for salaries hitherto undrawn.

Ohio.

October 30: The commission authorized the Sidney Telephone Co., of Sidney, to distribute a stock dividend of $34,500.

October 30: The commission authorized the Home Telephone Co., of Ironton, to issue $16,000 of first mortgage 6 per cent bonds, to reimburse its income for capital expenditures made in the past five years. The proceeds of these bonds will now be available for dividends.

October 30: The commission approved the issuance of $20,000 common stock of the Urbana Telephone Co., to be used to pay for the local plant of the Central Union Telephone Co. In a previous order the Central Union was authorized to buy this $20,000 of new stock in addition to $25,000 of the stock now outstanding.

Wisconsin.

November 8: Hearing on the application of the Platteville, Rewey & Ellenboro Telephone Co. for an increase in rates. U-1459.

November 12: Hearing on the application of the Home Telephone Co. for authority to increase rates. U-1460.

November 13: Hearing on the application of the Random Lake Telephone Co. for authority to increase rates. U-1461.

November 14: Hearing on the application of the Oakfield Telephone Co. for authority to increase rates. U-1463.

November 21: Hearing on the application of the Plain Telephone Exchange for authority to increase rates. U-1466.

Appraisals of Telephone Properties

Actual Performance Basis for Appraisals Applied to Items of Property as Inventoried—Unit Costs Derived from Careful Analysis—Method Used by Pacific Telephone & Telegraph Co. Published in The Pacific Telephone Magazine

By C. E. Fleager

During the past four years the Pacific Telephone & Telegraph Co. has been actively engaged in inventorying and appraising its property in the states of Washington, Oregon and California for submission to the public service commissions. The appraisal of this property is made on the basis of actual performance applied to the items of property as inventoried.

This actual performance basis has been determined from the costs as shown by the official records of the company, which are kept in accordance with the system of accounting for telephone companies prescribed by the Interstate Commerce Commission and approved by the various public service commissions.

Divisions of Appraisals.

Following the arrangement of the inventory, the appraisal has been divided and arranged by exchanges, and subdivided and arranged into the various accounts in accordance with the standard accounting system. This arrangement corresponds exactly to the arrangement by which the costs, as daily experienced by this company, are recorded.

In determining these actual performance costs, the records of the company were gone over in detail and carefully analyzed. From this analysis there were derived unit costs applicable to the various accounts as hereinafter indicated under the following headings:

(a) Material.
(b) Supply expense.
(c) Labor.
(d) Supervision, engineering and tool expense.
(e) Incidentals.
(f) General expense.
(g) Omissions.

(a) Material—Items have been appraised as material which are ordinarily classified as material in the operation of the company.

All items of material, as listed in the inventory, were, in general, appraised by the application of average material costs, determined by averaging prices actually paid for the various items of material.

In certain accounts, such as the Station Installations account, it was impracticable to inventory the items of material and material was appraised by the application of an average unit cost determined from the cost analysis. In other accounts it was practicable to inventory only the major items of material, and the amount of miscellaneous material associated with the major items has been determined from the cost analysis.

(b) Supply Expense—Supply expense as accounted by this company, and therefore as used in these appraisals, includes all those items of expense prescribed by the Interstate Commerce Commission under account No. 704, which reads as follows:

704. Supply Expense—Charge to this account, or to appropriate sub-accounts, all expenses (except insurance and taxes) incurred directly in connection with the purchase, storage, handling, and distribution of materials and supplies and stationery.

It includes (1) the pay and expenses of purchasing agents, managers of stores, clerks, and laborers; (2) rents paid for stores; (3) cost of lighting and heating; (4) undistributed transportation charges; (5) discounts recovered through prompt payment of bills for materials and supplies when such discounts can not be assigned to the particular bills; (6) overages or shortages in the materials and supplies account disclosed by inventories which can not be assigned to specific accounts; and (7) the estimated depreciation on materials and supplies due to breakage, leakage, shortage and wear and tear.

This account should be cleared by adding to the cost of materials and supplies passing through stores a suitable loading charge which will equitably distribute the total cost of conducting the stores and by adding to the cost of such supplies as are bought by the purchasing department a pro rata share of the total expense for the purchasing department.

It will be noted from this definition that Supply Expense comprehends more than is frequently included under Storeroom Expense, which, as is shown in the following, is only one portion of Supply Expense.

Supply Exchange Groups.

The several items of Supply Expense are grouped as follows:

Storeroom expense.
Undistributed freight and cartage.
Supply adjustment.

Storeroom Expense covers the pay and expenses of employes and agents engaged directly in the purchase, storage, handling, and distribution of materials and supplies; house service and rents paid for storerooms and office quarters; boxes, crating, and packing materials, and miscellaneous expenses.

Undistributed Freight and Cartage. On materials and supplies shipped directly from the manufacturer or supplier to the company, freight, express, and cartage are billed as a part of the cost of the materials and supplies. However, when materials and supplies are shipped from one supply point, other than the manufacturer, to another supply point and such materials and supplies are not designated at the time of shipment for a specific job, the cost of such freight, express, and cartage is charged to Undistributed Freight and Cartage, and is accounted as a part of Supply Expense.

Overages and Shortages.

Supply Adjustment refers to the monthly provision for the change in value of unused materials and supplies, and for such adjustment as is necessary on account of shortages or overages not assignable to a specific account. Included in these items of expense are the breakage, leakage, shortage, and wear and tear on materials and supplies, and the overages or shortages in the materials and supplies account disclosed by an annual inventory.

These overages or shortages arise not only from overages or shortages in items, but also due to the fact that as material prices are constantly varying, making it impracticable to designate in the daily accounting operations of the company the exact price at which individual items of material have been purchased, average price lists are made up and are used by the accountants in their daily transactions.

Supply Expense was appraised by the application of an actual performance cost percentage to the appraised cost of material passing through stores as determined from the appraisal of material. The actual performance cost percentage used was obtained from the official records of the company for the territory under appraisement.

(c) Labor—The term Labor as used in these appraisals includes the salaries and wages of every employe of the company engaged in construction work whose time can be, and is, charged directly to a specific job, and the salaries and wages of employes of the Western Electric Co. in the installation of central office equipment by contract, but not including any factory labor.

Salary and Wages.

The salaries and wages of those employes and officers of the company whose time can not be charged directly to a specific job are not included as Labor but as Supervision, Engineering, or General Ex-

pense. The salaries and wages of employes of contractors other than the Western Electric Co. are included in the item Incidentals.

The appraisal of Labor was not made on the basis of the application of costs to each particular labor operation, since in the normal performance of telephone work it is practically impossible to record such costs and no such detailed record has ever been made. The records, however, do show the labor cost of doing work subdivided into the accounting classifications of plant, and the application of unit costs determined from the records of actual performance, as applied to accounting units of plant, actually best determines the cost of constructing plant in the manner in which telephone plants are actually constructed. Consequently such recorded labor costs can be, and for the purpose of this appraisal were, resolved into a unit expressive of each account.

(d) Supervision, Engineering, and Tool Expense—Supervision, Engineering and Tool Expense as accounted by the company, and therefore as used in these appraisals, includes all the items of expense prescribed by the Interstate Commerce Commission under the accounts: 706. Plant Supervision Expense; 705. Engineering Expense; 703. Tool Expense, which reads as follows:

706 Plant Supervision Expense—Charge to this account the cost of general supervision of the maintenance and construction of the plant where a separate department of the company's organization is charged with such supervision. It includes the pay and expenses of the plant supervising officers, such as the general plant superintendent, district plant superintendent, plant engineers and their office and field forces, charged with planning for and superintending the work of maintenance and plant construction.

This account, or appropriate subaccounts, should be so arranged as to show in detail the expenses of the plant supervision department as follows: (1) Salaries and wages; (2) personal and incidental expenses of employes; (3) rent paid for offices; and (4) office expenses.

This account should be cleared by charging directly to the appropriate accounts such expenses as can be allocated to particular pieces of work and by charging out the balance on the basis of labor employed in all construction or maintenance work in progress.

Note—The pay of general foreman and foremen in direct charge of jobs should be included in the cost of the job and not charged to this account.

705. Engineering Expense—Charge to this account or to appropriate subaccounts all expenses for engineering so as to show separately the following: (1) Salaries and wages; (2) personal and incidental expenses of engineering department employes; (3) rent paid for office, and (4) office expenses.

This account should be cleared by apportioning the total expenses to operating expenses and fixed capital accounts on the basis of service rendered, as determined by the actual time devoted to particular jobs or on an equitable basis fixed by the officers of the company.

703. Tool Expense—Charge to this account all expense for tools (except shop tools and tools carried as supplies unissued). It includes (1) the cost of small hand tools of which no account is kept after issue; (2) the cost of repairing tools; (3) the cost of tools lost or stolen; (4) depreciation on tools taken out of service because of breakage or other deterioration.

This account should be cleared by adding to the expense of repairs and cost of plant installed such amounts as will equitably distribute the total expense for tools.

Plant Supervision Expense includes the pay and expenses of the general superintendent of plant, division superintendents of plant, district superintendents of plant, and their office and field forces charged with superintending the work of maintenance and plant construction. It does not include the pay and expenses of general foreman, foremen and wire chiefs in direct charge of the jobs, which expense is charged directly to the work accounts.

The total monthly charge to Plant Supervision Expense is allocated to Maintenance, Construction, and Removals on the basis of the percentage relation which exists between the amount charged each month as Plant Supervision Expense and the labor charged to Maintenance, Construction, and Removals during the same month.

Engineering Expense includes the pay and expenses of the chief engineer, division plant and equipment engineers, and district engineers, with their staffs, office, and field forces, when such expense is not allocated to any specific job.

Allocation of Expense Charges.

The total monthly charge to Engineering Expense is allocated to Construction, Removals, and Extraordinary Repairs on the basis of the percentage relation which exists between the amount charged each month as Engineering Expense and the labor charged to Construction, Removals and Extraordinary Repairs during the same month.

Tool Expense includes the cost of small tools which are charged to the Tool Expense account when purchased, the cost of repairing all tools, tools lost and stolen, and depreciation on tools carried in the account General Tools and Implements; also all repairs to wagons and motor vehicles where such charges are not made to Stable and Garage Expense.

The total monthly charge to Tool Expense is allocated to Maintenance, Construction, and Removals on the basis of the percentage relation which exists between the amount charged each month as Tool Expense and the labor charged to Maintenance, Construction and Removals during the same month.

Supervision, Engineering, and Tool Expense was appraised by the application of an actual performance cost percentage to the appraised cost of labor of telephone company employes as determined from the appraisal of Labor. The actual performance cost percentage was obtained from the official records of the company for the territory under appraisement.

(e) Incidentals—The term Incidentals as used in these appraisals includes all those items of cost incurred in the construction of telephone plant that do not come under the definitions Material, Supply Expense, Labor, Supervision, Engineering and Tool Expense, and General Expense as defined in this report and as used by the company in its daily transactions.

The appraisal of Incidentals was made on the same basis as the appraisal of Labor for the corresponding accounting classifications.

(f) General Expense—General Expense as accounted by the company, and therefore as used in the appraisals, includes that portion of General and Miscellaneous Expenses, Traffic Superintendence, and Commercial Administration as is properly chargeable to construction. These expenses are defined in the accounting circulars of the Interstate Commerce Commission under the accounts:

660. General office salaries.
663. General office supplies and expense.
667. General law expenses.
621. Traffic superintendence.
640. Commercial administration.

Percentage Relations.

The proportion of General Office Salaries, General Office Supplies and Expenses and General Law Expenses charged Construction are determined on the basis of the percentage relation existing between the total salaries and wages charged Construction and the total salaries and wages charged all construction and expense accounts. The proportion of traffic superintendence and commercial administration charged Construction is the actual pay and expenses incurred in the general traffic and general commercial offices, respectively, on account of engineering of new construction.

General Expense was appraised by the application of an actual performance cost percentage to the appraised cost of the sum of Material, Supply Expense, Labor, Supervision, Engineering and Tool Expense, and Incidentals, as determined from the appraisal total. The actual performance cost percentage was determined from the official records of the company showing the cost of General Expense and corresponding cost of construction.

(g) Omissions—In an inventory and appraisal of a plant of the nature and character of a telephone plant, it is not possible to obtain the number of physical items exactly. Omissions are incurred in general due to property not counted or computed or clerical errors in assembling or transcribing. It has been the experience of engineers on inventories made at various times that invariably there are

items omitted which should have been included. The chance that there is an overage in quantity has been found to be slight. Furthermore, such errors are not compensating and must therefore be allowed for.

The item of Omissions was appraised by adding to the appraised amount in each accounting classification a suitable percentage of that amount. This percentage was based upon judgment and experience gained in inventorying large amounts of property and upon the methods pursued in taking the inventory.

Construction Losses—In constructing telephone property, it is necessary to purchase and handle a greater number of the various items of material than finally appear in the completed structure. These construction losses are occasioned, due to various causes such as the cutting off of the ends of cable in testing and splicing two pieces together and the breakage and loss of items on the job.

As these items are reported by the field forces the same as plant actually constructed, they enter into the reported units of plant and thereby affect the unit cost of plant as determined from an analysis of records. That is, if it is necessary to purchase 306 feet of cable to place in an underground section of 300 feet and allow enough for testing and splicing, the 306 feet of cable would be reported as the amount of cable placed, while 300 feet would be the amount that would be inventoried at the completion of the job.

If the complete cost of this section of cable was $306, its unit cost determined from the recorded amount would be $306 divided by 306 feet, or $1 per foot. Then if the unit cost of $1 per foot were applied to the inventoried length of 300 feet, the appraisal would total but $300, while the cost was $306.

Accordingly, in appraising the items of property inventoried by the use of actual performance costs, it is necessary to provide for construction losses in order that the cost units may be applied on the same basis as they are actually incurred.

The proper allowances for these construction losses were determined in each classification of property by engineers and foremen experienced in the design and construction of that type of plant.

Peace Celebration Causes Great Telephone Traffic Load.

Indiana's two big patriotic celebrations —the one Monday in commemoration of the signing of the armistice and the one Thursday of last week when the unfounded report that Germany had signed up was circulated throughout the world—gave telephone operators all over Hoosierdom an unprecedented workout. Reports from over the state indicate that practically every exchange in every city, town and hamlet was swamped with calls.

The fact that news of the real signing of the armistice terms came at an early morning hour caused the operators to be deluged with calls asking whether the whistles were announcing the cessation of hostilities. One nice thing about the two celebrations was that they made it so the work of the telephone operators was divided about equally between the night and day shifts. The day operators got their "workout" first and the night operators "got theirs" later.

While the excited Indianians shouted and paraded the streets, the telephone operators patiently worked, plugging in and out, connecting and disconnecting telephones. The work started from the time the whistles started to blow and continued for hours. At Evansville the nervous strain and excitement were so great that eight operators became hysterical and fainted.

For the first time in the history of the Evansville exchange, W. H. Horrell, traffic superintendent, gave the operators permission to answer questions direct from the switchboards. The Evansville exchange is operated daily with an average load of 100,000 calls, Mr. Horrell stated. The load was practically doubled during the celebrations, he said.

Selling Goods by Telephone.

The method of selling goods by telephone, given below, was described by D. M. Perrill in a recent issue of *Advertising & Selling*. It was dug up in an ice machine sales office in Kansas City, in August of 1914.

It had been 110 in the shade every day for a week, and business was about as plentiful as snow on the Missouri river. Even in normal times, coffin nails look like a tarantula dancer besides refrigeration machine business in the month of August—and this was in 1914. We had just been sent to Kansas City on a long bet to try out a new territory. No preliminary work had been done, so there were not even prospect lists to work on. The getting of business was strictly up to us.

Just at this time we heard a rumor that a serum plant was going to put in an ice machine. Madame Rumor failed to divulge where, how, or why—only when; right away.

One of the rules of our firm was that we should never use a telephone if it was possible to see the prospect in person. But there were several of these serum plants making a serum for vaccinating hogs for cholera. There was a big field in the stock-raising territory about Kansas City. These serum plants aren't very desirable, and they were located in out-of-the-way places all about the city.

To personally visit them would take too long. The job might be gone before we located the plant.

So we took the classified telephone directory and went down the list. A standard form of conversation something like this was used: "This is the Blank Refrigeration Machine Co. We have just heard that a serum plant is about to purchase an ice machine. We thought you were probably the company that is to make the installation."

It is surprising how this got results. The companies called seemed to feel that they ought to buy an ice machine if such a report was out. Invariably, we were referred to the party who had the final authority in such affairs. Several told us of plans they had of expanding within the next few months, for it seemed that some new legislation had made the vaccinating of hogs compulsory and had about trebled the serum business.

When we had finished the list we not only had the name of the company about to purchase but three other live prospects as well. Madame Rumor had evidently done us a favor in failing to go into details.

Inasmuch as the method had given such success in this list, we proceeded to manufacture rumors for every other type of prospect and go through them in the same way. Of course, we never merely called up a concern and asked them if they were going to buy an ice machine. Instead, we worded our inquiry so that, without actually committing ourselves, we let them think that we had good reason to believe they were actually considering the purchase of a machine. Often in large concerns we talked with three or four departments, and finally with the head of the concern in the endeavor to trace down the elusive rumor. But its source was never discovered.

As nearly as we could ascertain, the method seemed to comb out nearly all of the prospects. It dug up fellows who had thought of buying but had dropped the matter for the moment. It brought out the men who were troubled temporarily with a case of cold feet, which would thaw for the first red-blooded salesman carrying a red-hot message.

When we found a concern that was not a prospect, it was often possible to put in some good missionary talk. In any case, we always asked if they knew of any other concern in their line of business in need of refrigeration equipment.

When a man would give us a list of names, we sometimes employed some of the old house-to-house tactics, and obtained permission to use his name in speaking to the other people. We got prompt, courteous attention, and there was no foot-warming in vestibules so often experienced by missionary salesmen. In the end we had a list of live prospects that would have taken us months to have got together with the methods we had been using.

Biographical and Personal Notes

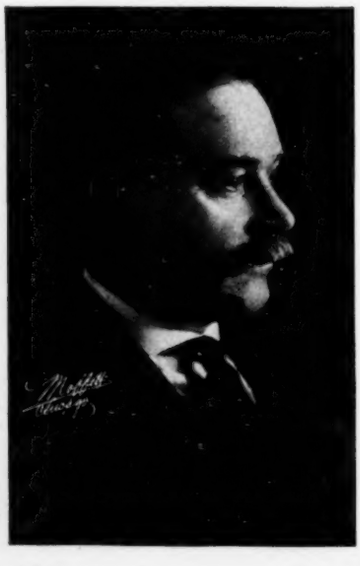
W. P. Hawley, manager of the Bluefield Telephone Co., of Bluefield, W. Va., operating in the famous Pocahontas coal fields of West Virginia, has been with the company in that capacity since September 7, 1896, when it operated but 34 telephones and had but $2,800 capital stock. From that small beginning it has grown, under Mr. Hawley's constructive and conservative policies, to a system comprising 12 exchanges and serving about 4,200 subscribers, with $300,000 capital stock and an investment of about half a million dollars.

The company has paid regular dividends of 6 per cent per annum since October 1, 1904. Two of the exchanges have common battery equipment and the other ten magneto, but all of them have the latest type of equipment. The gross receipts are $36 per telephone per year.

Mr. Hawley's aim has always been, and is, to give good service and make profits. That he has been successful is evidenced by the fact that he has a satisfied community and stockholders who do not sell their stock. The company has no competition, and has never had any.

West Virginia is Mr. Hawley's native state. He was born in Beckley, a city of about 2,000 population, on July 22, 1868, and graduated from the State Normal School at Athens, W. Va.

Mr. Hawley is a coal operator and has been in the mercantile business for 30



W. P. Hawley, Manager of the Bluefield Telephone Co., Bluefield, W. Va.

years, operating one of the largest department stores in the city of Bluefield at the present time. He is a Mason, a life member of the Elks and a member of the order of Red Men. There's no question about his business ability—his record shows he is a capable man who has followed broad constructive policies.

In addition to being a broad-minded conservative practical man, Mr. Hawley is quite a deep thinker and methodical in all his actions—he believes in "a place for everything and everything in its place."

Chas. C. Deering, of Des Moines, Iowa, secretary-treasurer of the Iowa Independent Telephone Association, was one of two delegates from Iowa to a convention of representatives of all state councils of non-war construction held in Washington this week. Governor W. L. Harding was the other Iowa delegate.

E. W. McGinnes, district manager for the Consolidated Telephone Co. at Wilkesbarre, Pa., for the past six years, received his start in the telephone business as stenographer with the United Telephone & Telegraph Co., of Pottsville, Pa., in June, 1900. A year later he was transferred to Harrisburg as assistant to the district superintendent.

He was made special agent for the United company in January, 1904, and in November of that year was sent to Sunbury, Pa., as assistant to the district superintendent. In May, 1906, he accepted a position with the Consolidated Telephone Co., at Wilkes-Barre. Soon thereafter he was given a three months' leave of absence to go to Hillsboro, Texas, to take over a company from the contractors for the telephone company, employ a manager and get things going properly.

Returning to Wilkes-Barre, he remained there until May, 1909, when he accepted a position with the Mississippi Home Telephone Co., of Jackson, Miss., having charge of the construction of a complete new automatic exchange in the city of Jackson. After this plant was completed and everything was running smoothly, he was transferred to Meridian, Miss., as superintendent.

On account of his father's death he returned north and accepted a position with the American Union Telephone Co. as special agent in July, 1911. After he had been with this company a short time he was made manager at Erie, Pa. About six months later he was transferred to Easton and from there to Wilkes-Barre as district manager, which position he is filling at the present time.

Roy W. Hall, manager of the Westfield-Kansas Telephone Co., of Westfield, Ill., was a school teacher before he became interested in the telephone business. He was born in Westfield, October 2, 1876, and after graduating from Westfield College with a B. S. degree he worked as a telegraph operator for about a year. He then taught school for several years.

In 1904 he and his brother purchased the Westfield Telephone Co. with less

Roy W. Hall, Manager of the Westfield-Kansas Telephone Co., Westfield, Ill.

than 100 telephones. In the fall of 1911 they purchased the Kansas Telephone Co. with about 300 telephones, consolidating the systems and changing the name to the Westfield-Kansas Telephone Co. Since that time the system has grown to 700 telephones.

Mr. Hall is a member of both state and national association and is secretary and treasurer of the Eastern Illinois Independent Telephone Association. A keen, matter-of-fact man is Mr. Hall, who keeps his "eye on the ball" all the time. He has always been a hard worker and enjoys being constantly in action. While there are few things which escape his observation—for he is a good observer—Mr. Hall keeps the facts to himself for use when required. A secret is in excellent keeping in his hands.

Obituary.

Samuel S. Algire, for many years manager of the Farmers' Telephone Co., at Wolcottville, Ind., died at his home there recently as a result of complications which were the outcome of an accident which he suffered more than 25 years ago. While working with a bridge construction gang he sprained his back and the effects of the injury never left him. He was a member of the Masonic order and of the Methodist church of Wolcottville.

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Industrial Engineering Firm Engages Telephone Expert.

Chas. W. McKay, formerly of McMeen & Miller, Chicago, is now with the industrial engineering firm of Cooley & Marvin Co., Boston, Mass., which is specializing on both industrial and public utility appraisals. In the capacity of appraisal engineer, Mr. McKay will have full charge of this phase of the work.

Chas. W. McKay, Now Appraisal Engineer of Firm of Cooley & Marvin, Boston.

He will be in a position to handle telephone appraisal and engineering work either as a member of the Cooley & Marvin organization or independently, as occasion may demand. Cooley & Marvin have a large force of skilled utility accountants and in handling telephone valuation and rate matters, Mr. McKay is thus situated so as to look after both the accounting and engineering problems.

As author of the section on "The Valuation of Telephone Properties" of the Reading Course, "Fundamental Principles of the Telephone Business," published in TELEPHONY during 1917 and the early part of this year, Mr. McKay is well known to TELEPHONY's readers.

He has been engaged in telephone engineering and appraisal work since graduating from Sibley College of Mechanical Engineering, Cornell University, in 1906. In July, 1906, he entered the employ of the New York & New Jersey Telephone Co. (now the New York Telephone Co.) and after serving a brief apprenticeship in the maintenance department, was assigned to the newly organized plant engineering department. In 1909 he was appointed engineer for the North Brooklyn district, having charge of the preparation of plans and estimates for all outside construction work within the district.

In 1910, at the time the New York Telephone Co. absorbed all of the up-state Bell companies, Mr. McKay was assigned to special work and spent the greater part of the next year in inspecting a number of the larger of the company's newly-acquired properties, making plans for cut-overs and such renovations as he deemed necessary to put the properties in first-class operating condition. In 1911 he was recalled to the company's headquarters in New York and subsequently appointed engineer for the Borough of Queens.

Resigning from the New York Telephone Co. in the spring of 1912, during the year 1912-13, Mr. McKay was associated with Henry Floy in the capacity of assistant engineer. While with Mr. Floy he was identified with several important appraisal cases, the Belt Line Railway Corporation of New York City among others.

In the summer of 1913 Mr. McKay became engineer to the McCall & Clark Co., efficiency experts, of New York, and in October, 1913, affiliated himself with McMeen & Miller, of Chicago. While with this well-known engineering firm, he spent the major portion of his time on problems involving the appraisement of public utility properties. In the spring of this year Mr. McKay became engaged in valuation work for the Central Union Telephone Co., continuing in this work until the middle of last month when he became appraisal engineer for Cooley & Marvin.

Bulletin on Four-Party Service Issued by Kellogg Company.

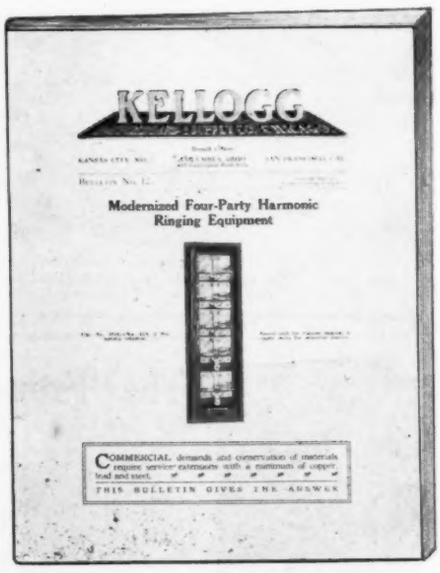
The new No. 12 Kellogg four-party line bulletin is not really a "sales bulletin" but rather 32 pages of powerful argument for the further introduction of four-party service, particularly in these times when it is necessary that extension demands be taken care of with a minimum of copper, lead and other materials.

The average telephone man naturally supposes that full advantage of four-party service is being taken, but manufacturers report that while cable mills, during the past two years, have been running day and night, grinding out cable purchased at 100 to 150 per cent advance over normal prices, very few exchanges have introduced four-party service. Although manufacturers have been able to deliver selective ringing equipment promptly and at a nominal advance over normal prices, their combined sales of selective ringing equipment are said to have been lower than during any previous period in the days of low-priced cable.

This condition would seem to indicate that the economy, simplicity and satisfaction of modern four-party selective service have not been properly forced to the attention of the telephone companies which have made, or are now contemplating, considerable expenditures for cable.

The bulletin goes into these questions thoroughly and explains how the shortcomings of the earlier systems of selective ringing and the fact that this has been a favorite "stamping ground" for inventors, have tended to put four-party selective "in bad," but that the limited increased adoption of modern four-party harmonic ringing at this time is attributable to the influence of Bell companies, hostile to harmonic ringing because it is wholly of Independent development.

The bulletin also contains a complete history of the development of four-party service, including much discussion of matters which have heretofore been largely engineering secrets. A telephone man cannot but acquire a broader view and a better understanding of the whole four-party selective propositions from a thorough reading of this most unusual bul-



Cover Page of Kellogg Booklet.

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ST. LOUIS, MO.

OUR EXTRA HEAVY DOUBLE GALVANIZED WIRE INSURES
HIGHEST EFFICIENCY.
LONGEST LIFE.
LOWEST COST OF UPKEEP.

It's easy to determine, TEST IT.

As wire will test best, so also will it last best and give better satisfaction while it lasts.

We guarantee our wire to conform with all standard specifications as well as to be satisfactory to the purchaser.

IT'S THE ONE BEST PROVEN BY TEST.—*TRY IT.*

Handled by most representation jobbers and supply houses.

Write for samples, test and compare.

INDIANA STEEL & WIRE COMPANY
MUNCIE INDIANA U. S. A.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

letin which the Kellogg Switchboard & Supply Co. will send without charge upon request.

Republic Trucks Show Their Value in Telephone Field.

There is scarcely a telephone company of any size in the United States that is not either operating or considering the purchase of motor tucks. It has been proven over and over again under all sorts of conditions and in every part of the country that the speed and power of motor-driven vehicles can be used with great profit in this field.

Republic motor trucks have made enviable records in telephone service. Many of them have been sold to both Bell and Independent companies and in every case they have done the work required of them consistently and economically.

Republic trucks are furnished in seven different models in capacities ranging from ¾-ton to 5-ton, so that it is possible to select from this line a truck exactly suited to the requirements of the company purchasing it. Many telephone companies whose principal use for a motor truck consists in hurry-up repair trips and carrying light equipment for making installations, are using the 1,500-pound Republic Dispatch or the 2,000-pound Republic Special with express or stake bodies and with pneumatic tires in order to insure speed and safe carrying of delicate apparatus.

At the other extreme are the big 3½-ton and 5-ton Republics which are used by telephone companies for hauling heavy construction equipment and even big loads of long heavy poles. In line building such trucks have been found a great economy factor and Republic trucks have the strength and sturdiness to stand up under this rigorous service for years.

In between these two capacities are the one 1½ and 2-ton Republics which are general purpose trucks with the ability to handle a great deal of the hauling that enters in both the two other fields.

In addition to load carrying, these trucks have been used profitably in other ways. The accompanying illustration shows a Republic truck furnishing the power for a block and tackle in setting poles. Several companies have used their Republics for this purpose and found them time and money savers.

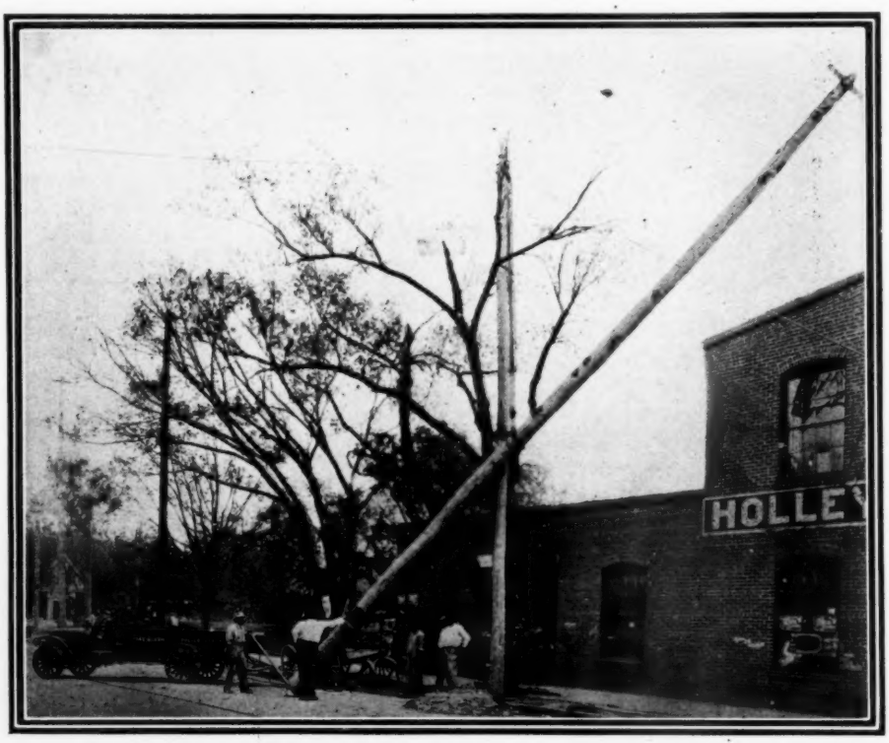
The success of Republic trucks in telephone service is just a reflection of their success in other industrial fields.

It is contended that more than twice as many of them were produced and sold last year as any other make of truck in spite of the fact that it is only five years since the first Republic truck was put upon the market.

The secret of their success in all industries where power and stamina are essential is attributed to their strength and simplicity of design and to the Torbensen internal gear drive which is used in all Republics.

This drive applies the power nearer the rim of the wheel, gaining a tremendous leverage and operating consistently and smoothly from a standing start or at any speed. It is not a part of the load-carrying axle and so is relieved from stresses and strains that might tend to weaken it or shorten its life. The entire load is carried on a separate I beam of solid forged steel, a form of construction well known for its lightness and strength. Because of the double reduction furnished by this type of drive and because the load-carrying axle is separate from the driving mechanism, the size of the differential housing is greatly reduced and 45 per cent greater road clearance gained.

Telephone companies operating trucks where muddy and snow-blocked roads have to be reckoned with, have found these features particularly advantageous.



Republic Truck Furnishing Power for a Block and Tackle in Setting Poles.

Efficient Telephone Service

can be secured only by the use of efficient modern equipment. You will find such apparatus advertised in TELEPHONY.